UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

November 2003

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Meteorological Office
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EX1 3PB

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Air temperature (Degrees C).
:Relative Humidity (%).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:PGE	:Percentage of observations with gross errors.
:%REJ	:Percentage of observations flagged excluding those with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)
:15 degrees (air temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

```
IDENTIFIER   ELEM      NOBS   PGE  %REJ      SD    BIAS     RMS

A8AS7         P          24     0    13     0.5     4.1     4.1
A8CK6         P          27     0    70     1.2    -4.8     5.0
CG2556        P          23    17    17     1.1    -9.9    10.0
C6FV4         P          39     0    26     0.7     4.5     4.6
DHEB          P          31     0    87     0.8     5.5     5.6

DQVI          P          64     0    92     1.1     4.8     4.9
ELSR6         P          62     0    98     1.7    -7.4     7.6
ELXT9         P          36     0     3     1.2     5.0     5.2
ELZT3         P          76     0    80     4.5    -8.7     9.8
MANE          P         156     0    64     0.8     4.5     4.6

OULA2         P          22     0     5     1.1    -6.4     6.5
OVRY2         P          25     0    36     4.8    -4.0     6.2
TEST          P          79    96   100     0.3    -0.2     0.3
UCTR          P          44     0   100     1.4   -10.3    10.4
UCUO          P          30    20   100     4.1    -9.2    10.1

UIAH          P          89    21    82     5.0    -7.0     8.6
UICO          P          40    10    72     6.9     1.9     7.1
UIZE          P          64     0    61     6.1     3.8     7.1
VCLN          P          20    25    30     3.4     0.7     3.4
VOTV          P          37    86    92     5.5    -2.3     5.9

VTKW          P          24     0    54     2.2    -4.9     5.4
V2OB1         P          49    14   100     5.7    -4.4     7.2
WCY7054       P          42     0   100     1.3     5.8     5.9
62166         P          49     0   100     4.0     4.8     6.3
62402         P          28     0    89     1.9     5.6     5.9

8PNO          P          20     0    85     1.5     5.0     5.3
IDENTIFIER   ELEM      NOBS   PGE  %REJ      SD    BIAS     RMS

A8CB8        SPEED       38     0    16     5.3     5.2     7.4
ELRE7        SPEED       22     0    14     3.0     6.0     6.7
ELZT3        SPEED       54    30   100     0.7    20.0    20.0
LMWO3        SPEED       20    10    25     4.9     5.5     7.4
MZPQ3        SPEED       45     2    49     5.9     6.0     8.4

P3CE9        SPEED       60     8   100     7.6     6.2     9.8
SWYM         SPEED       20     0    30     2.4     6.3     6.8
UETM         SPEED       31     0    13     4.4     6.3     7.7
VNVF         SPEED       35     0    23     5.2     5.5     7.6
VRWK3        SPEED       21     0   100     3.1     5.7     6.5

V2DX         SPEED       34     3    47     5.0     5.0     7.1
V2EA4        SPEED       65     0   100     4.9     6.9     8.5
V2FN         SPEED       21     0   100     5.6     8.8    10.4
V2OH1        SPEED       49     8    61     6.6     7.1     9.7
ZCDG4        SPEED       43     2    56     2.9     5.1     5.9

3ETX6        SPEED       84     7   100     4.1     7.9     8.9
3FEI6        SPEED       61     0   100     3.0     5.3     6.1
IDENTIFIER   ELEM      NOBS   PGE  %REJ      SD    BIAS     RMS

ELZT3        DIRN.       54    30     0    13.0   -46.8    48.6
ELZV9        DIRN.       20     0     0    89.8   -91.8   128.4
MCDZ9        DIRN.       25     0     0    45.1   -70.1    83.4
SP32         DIRN.       32     6     0    69.6    49.9    85.6
UANA         DIRN.       32     0     0    84.4   -19.7    86.7

UICO         DIRN.       35     0     0    90.9   -19.1    92.8
3ETX6        DIRN.       53    11     0    78.9   -38.6    87.8
IDENTIFIER   ELEM      NOBS   PGE  %REJ      SD    BIAS     RMS

CGDT          T         511     0   100     3.6    -5.3     6.4
CYLY          T          29     0   100     2.3     4.8     5.3
ELZT3         T          76     0   100     1.5    -6.5     6.6
SP32          T         111     0   100     3.6    -5.6     6.7
TEST          T          83    16   100     8.1     0.2     8.1
```

V7DN3	T	54	0	100	2.3	4.7	5.2
WAQ2746	T	62	3	100	3.9	5.9	7.1
WCW9126	T	108	6	100	3.2	7.5	8.2
WWU8	T	25	40	100	3.7	9.5	10.2
46081	T	689	8	100	3.7	7.1	8.0
46131	T	682	0	100	2.5	5.7	6.3
46146	T	680	0	100	2.3	6.1	6.5
46181	T	685	0	100	2.3	4.7	5.3
52085	T	48	25	100	1.1	0.4	1.2

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AW2	RH	45	0	100	9.6	15.9	18.6
A8BS2	RH	55	0	100	11.9	15.2	19.3
A8BZ6	RH	33	0	100	15.4	15.8	22.1
A8CC4	RH	26	0	100	12.2	20.3	23.7
CG2958	RH	181	0	100	11.4	-15.8	19.5
ELXF5	RH	59	0	100	9.7	-18.5	20.9
FNAT	RH	53	0	100	9.0	21.7	23.5
JBGY	RH	71	0	100	7.9	17.1	18.9
JDAI	RH	33	0	100	4.9	17.1	17.8
PPSO	RH	25	0	100	6.2	16.1	17.2
P3CE9	RH	51	0	100	24.8	-17.4	30.3
V2AW5	RH	20	0	100	7.9	17.2	18.9
V7DQ8	RH	40	0	100	6.5	15.0	16.4
XXUU	RH	29	0	100	6.4	15.9	17.1
ZNOR2	RH	87	0	100	12.9	21.0	24.7
ZSWAV1	RH	31	0	100	8.9	-32.2	33.4
4XFY	RH	25	0	100	7.1	15.2	16.8
8PNO	RH	20	0	100	13.0	19.2	23.2

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CG8048	SST	60	100	100			
C6IZ7	SST	32	9	100	1.4	3.6	3.9
ELVO5	SST	50	0	100	1.6	3.0	3.4
ELWO9	SST	38	0	55	2.7	-3.0	4.0
ELWY3	SST	24	4	100	0.8	3.0	3.1
ELXE2	SST	21	90	90	0.3	-2.4	2.5
ELXO4	SST	69	1	68	1.9	-3.8	4.3
ELZT3	SST	267	28	45	0.5	0.1	0.5
ELZV9	SST	44	14	84	2.4	-3.8	4.5
FNJI	SST	84	0	100	0.6	3.3	3.3
FNYF	SST	95	0	85	3.0	3.3	4.4
KGJX	SST	49	0	22	1.1	3.3	3.5
KRPB	SST	24	0	100	1.3	-3.5	3.7
KS011	SST	157	1	39	1.4	-3.6	3.9
LAEP4	SST	27	0	67	1.2	-4.2	4.4
LAJV4	SST	51	0	100	1.9	3.0	3.5
PDBY	SST	34	12	100	1.9	3.0	3.6
PHPO	SST	57	0	100	0.7	-3.5	3.6
P3CE9	SST	51	4	49	3.0	-3.3	4.5
SLCH	SST	23	4	100	1.2	3.8	4.0
S6TS	SST	74	3	100	2.2	-3.4	4.0
TEST	SST	79	96	100	1.4	0.7	1.6
UANF	SST	32	0	59	0.8	3.2	3.3
UCKG	SST	20	5	35	1.7	-3.0	3.5
UFSZ	SST	26	4	100	0.2	-5.6	5.6
UGMB	SST	39	0	36	2.0	-3.1	3.7
UHRT	SST	50	0	100	1.3	-3.6	3.9
UICO	SST	48	0	58	1.3	-3.8	4.0
VCTV	SST	26	8	88	3.5	-4.9	6.0
VCYP	SST	23	26	26	1.4	-1.1	1.7
VGLZ	SST	24	88	100	0.0	0.1	0.1
VQHV6	SST	30	0	47	1.3	-3.8	4.0
V2AR5	SST	42	0	95	1.5	3.6	3.9
WCW9126	SST	101	94	100	0.3	-1.1	1.1

WCZ5528	SST	72	0	58	2.3	-4.2	4.8
WGJF	SST	26	0	54	1.9	-3.4	3.9
WSRH	SST	21	0	29	1.0	-3.6	3.7
WWU8	SST	25	100	100			
ZCBQ2	SST	44	0	100	1.3	6.3	6.4
ZCBU5	SST	31	0	100	0.7	3.4	3.4
ZMFR	SST	170	28	100	0.5	-8.2	8.2
3FJV4	SST	22	0	100	0.8	3.7	3.8
31056	SST	266	100	100			
44137	SST	639	0	100	1.0	4.2	4.3
44142	SST	641	0	59	2.7	3.4	4.3
45139	SST	581	0	96	0.7	-3.5	3.6
45147	SST	443	100	100			
46131	SST	641	100	100			
46146	SST	636	100	100			
9KKS	SST	53	0	100	1.4	-4.3	4.5
9MTE	SST	24	0	100	1.0	3.8	3.9

Figure 1. SHIP/SYNOP mean daily count. NOVEMBER 2003
All hours
Global average number of observations in 24 hours = 20354

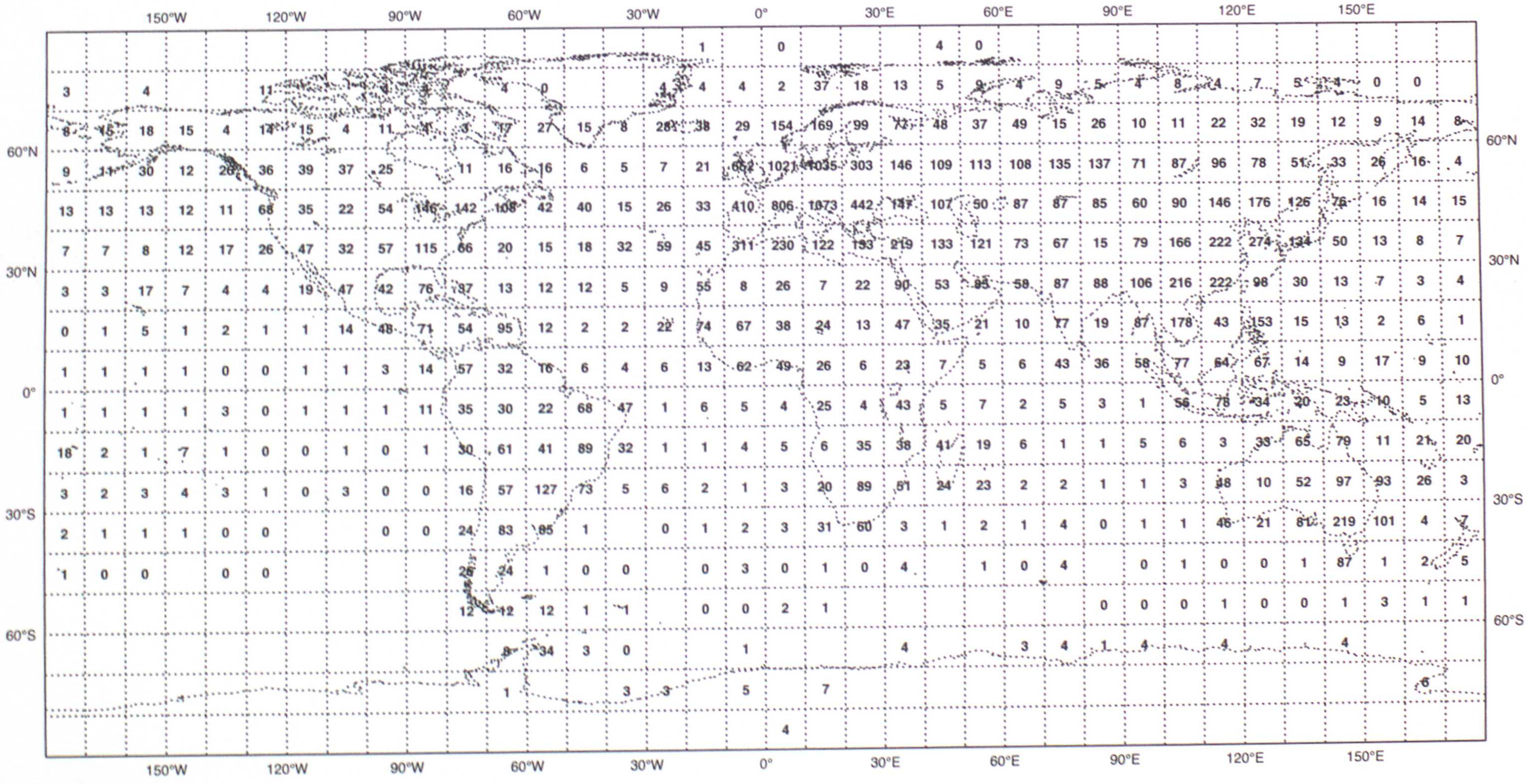
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		: All hours	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.	
	:PGE	:Percentage of observations with gross errors.	
	:%REJ	: Percentage of observations flagged excluding those with gross errors	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
	:10 degrees	(sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

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IDENTIFIER   LAT.   LONG.   ELEM    NOBS  PGE  %REJ    SD    BIAS   RMS

17653       -37.1   -12.3    P       140    0    99   0.8   -6.0    6.0
33600       -46.4   -37.7    P       547    1   100   3.0    4.4    5.3
56530       -18.6   106.5    P       412   38    41   1.4    1.4    2.0
62802        31.5   -23.4    P       297   30    48   5.1   -2.5    5.7
71543       -63.4   -71.2    P        26  100   100

IDENTIFIER   LAT.   LONG.   ELEM    NOBS  PGE  %REJ    SD    BIAS   RMS

52525        18.3   151.5   SPEED    335    0   100   1.5   -5.6    5.8

IDENTIFIER   LAT.   LONG.   ELEM    NOBS  PGE  %REJ    SD    BIAS   RMS

46702        38.7  -148.6   DIRN.     86    5     0 121.9  -63.7  137.5

IDENTIFIER   LAT.   LONG.   ELEM    NOBS  PGE  %REJ    SD    BIAS   RMS

12504        26.8    34.7    SST      63  100   100
32693         1.9  -103.0    SST     103    0    73   0.6    3.0    3.0
33502       -28.3   -20.0    SST     102    0   100   1.0    3.9    4.0
41643        31.8   -73.0    SST     772    0   100   0.5    4.4    4.4
44626        41.4   -64.8    SST     635    0    73   2.0    3.5    4.0

44742        43.4   -50.1    SST     565    0    70   1.1   -3.2    3.4
46972        18.3  -165.4    SST     164    0   100   0.2    4.6    4.6
51761         0.9   152.5    SST     140    0   100   1.3    3.2    3.5
56532       -55.2   135.3    SST     652    0   100   1.0    3.1    3.2
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Figure 2. DRIFTER mean daily count. NOVEMBER 2003
All hours
Global average number of observations in 24 hours = 10057

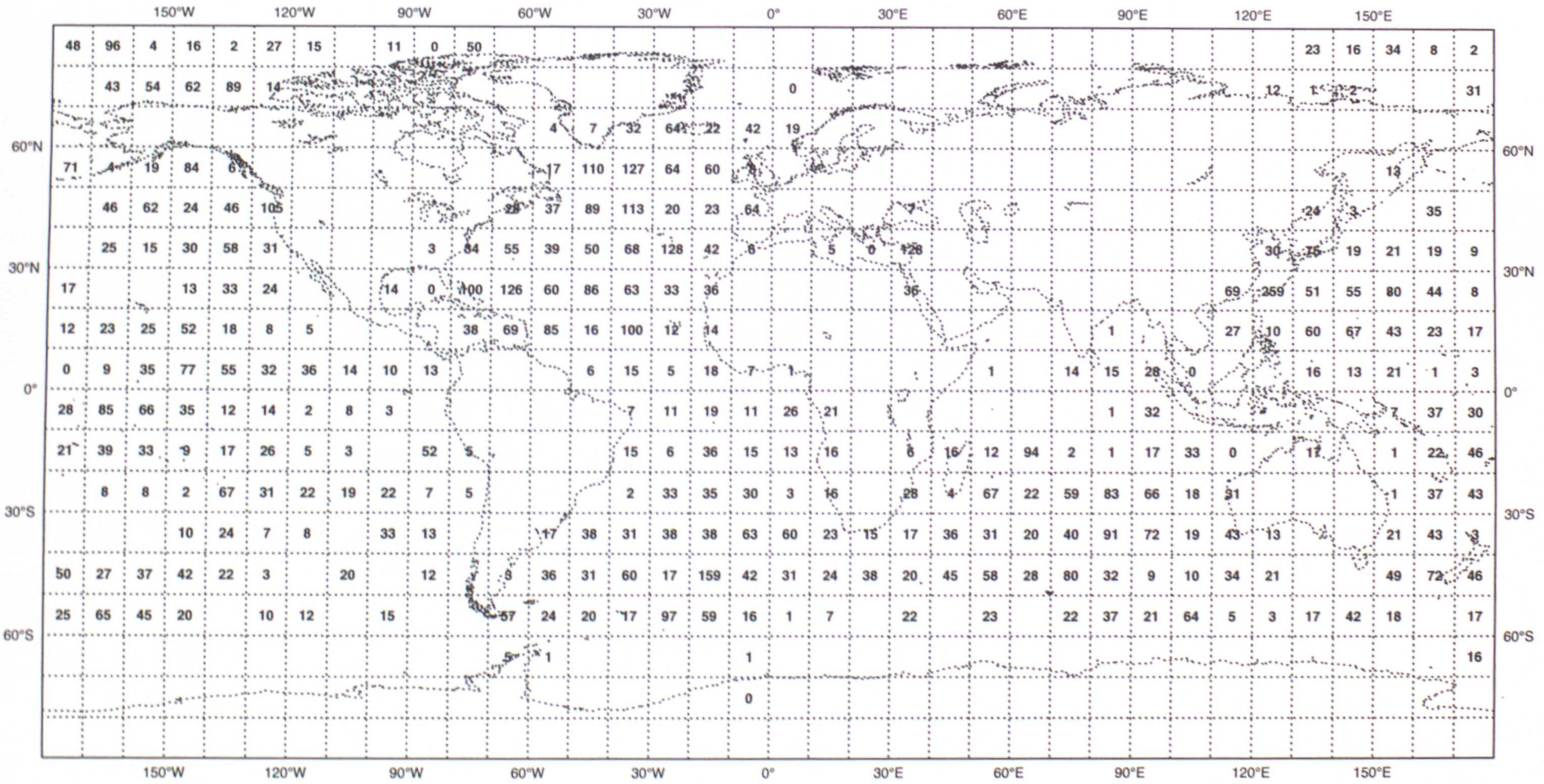

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
48 96 4 16 2 27 15 11 0 50 23 16 34 8 2
43 54 62 89 14 0 12 1 2 31
4 7 32 64 22 42 19
71 4 19 84 6 17 110 127 64 60 8 13
46 62 24 46 105 28 37 89 113 20 23 64 7 24 3 35
25 15 30 58 31 3 84 55 39 50 68 128 42 8 5 0 128 30 75 19 21 19 9
17 13 33 24 14 0 100 126 60 86 63 33 36 36 69 259 51 55 80 44 8
12 23 25 52 18 8 5 38 69 85 16 100 12 14 1 27 10 60 67 43 23 17
0 9 35 77 55 32 36 14 10 13 6 15 5 18 7 1 1 14 15 28 0 16 13 21 1 3
28 85 66 35 12 14 2 8 3 7 11 19 11 26 21 1 32 7 37 30
21 39 33 9 17 26 5 3 52 5 15 6 36 15 13 16 6 16 12 94 2 1 17 33 0 17 1 22 46
8 8 2 67 31 22 19 22 7 5 2 33 35 30 3 16 28 4 67 22 59 83 66 18 31 1 37 43
10 24 7 8 33 13 17 38 31 38 38 63 60 23 15 17 36 31 20 40 91 72 19 43 13 21 43 3
50 27 37 42 22 3 20 12 8 36 31 60 17 159 42 31 24 38 20 45 58 28 80 32 9 10 34 21 49 72 46
25 65 45 20 10 12 15 57 24 20 17 97 59 16 1 7 22 23 22 37 21 64 5 3 17 42 18 17
5 1 1 16
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION NOV 2003

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	49	5	10	0	1.3	-9.8	9.9
60728	36.4N	10.7E	1	MS	67	0	0	0	0.7	-8.6	8.6
62056	32.8N	21.8E	625	S8	61	1	2	0	0.6	-4.7	4.7
63801	4.9S	29.6E	882	S8	35	0	0	0	1.1	8.0	8.1
63881	8.0S	31.6E	1923	S	32	1	3	0	1.8	12.6	12.7
64654	8.4N	20.6E	510	MS	26	0	0	0	0.7	4.4	4.5
65355	9.8N	1.1E	342	MS	102	2	2	1	1.1	-13.3	13.3
68018	17.9S	19.8E	1083	M	22	15	68	0	0.8	-0.1	0.8
68030	18.5S	25.6E	1071	8	74	0	0	0	2.4	5.4	5.9
68038	20.5S	26.0E	903	8	75	0	0	0	0.8	4.7	4.8
68112	22.5S	17.5E	1712	S	22	19	86	86	0.3	-0.7	0.8
68212	24.5S	17.9E	1108	M	23	15	65	0	1.0	-0.2	1.0
68300	26.6S	15.1E	16	M	37	9	24	41	5.1	-4.3	6.7
68338	26.9S	24.6E	1234	S8	25	21	84	0	1.1	-1.0	1.5
68377	27.8S	30.0E	1238	S8	68	17	25	1	1.6	0.2	1.6
68396	26.5S	31.3E	641	S8	54	0	0	2	1.0	4.8	4.9
68575	30.0S	30.0E	1175	S8	108	108	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	MS	108	1	1	38	3.0	5.7	6.4
24688	63.3N	143.2E	741	MS	115	8	7	0	4.3	4.2	6.0
30554	54.5N	113.6E	995	MS	115	2	2	0	4.2	6.3	7.6
36982	41.9N	78.2E	3635	S7	114	0	0	0	0.8	6.1	6.2
38565	40.6N	65.7E	485	MS	115	60	52	0	2.3	-0.3	2.3
40435	24.5N	44.4E	991	MS	55	1	2	2	0.7	7.7	7.7
40700	39.6N	47.9E	45	M	111	2	2	5	1.7	-6.1	6.3
40713	37.4N	46.3E	1475	MS	111	52	47	1	0.7	13.8	13.8
40726	36.8N	45.7E	1384	MS	102	2	2	3	1.4	4.0	4.2
40741	36.5N	61.2E	235	MS	114	0	0	0	0.8	-4.9	5.0
40757	35.6N	53.4E	1171	MS	115	0	0	2	1.4	4.8	5.0
40780	33.6N	46.4E	1362	MS	110	0	0	0	0.6	4.8	4.8
41254	23.1N	57.6E	1755	S8	95	95	100	0			
41314	17.7N	54.0E	467	MS	111	0	0	0	0.5	4.0	4.0
44265	46.1N	91.5E	1186	MS	111	0	0	0	1.4	5.4	5.6
44416	28.6N	81.6E	720	MS	62	1	2	2	1.4	4.5	4.7
47022	40.8N	128.2E	1224	S	71	2	3	1	1.0	4.0	4.1
47678	33.1N	139.8E	79	MS	115	0	0	0	0.8	-9.1	9.1
48924	21.1N	101.5E	644	M	32	0	0	47	0.7	10.6	10.6
48925	20.7N	102.0E	550	S	46	2	4	0	0.7	-10.4	10.4
48938	19.2N	101.7E	326	MS	47	40	85	0	0.6	14.2	14.2
50727	47.2N	119.9E	1028	MS	115	0	0	0	0.8	4.4	4.5
51379	44.0N	89.6E	794	M	106	0	0	32	2.3	4.4	5.0
51495	43.2N	91.7E	874	M	107	0	0	0	1.9	8.6	8.8
52866	36.6N	101.8E	2262	S	115	0	0	0	1.1	-4.1	4.2
53083	44.6N	114.2E	1183	M	105	0	0	57	3.1	5.2	6.1
53352	41.7N	110.4E	1377	M	104	0	0	31	2.7	4.6	5.3
53480	41.0N	113.1E	1416	M	105	0	0	30	2.6	5.0	5.6
53487	40.1N	113.3E	1069	M	106	0	0	11	2.3	4.3	4.9
53593	39.8N	114.6E	910	M	104	0	0	29	2.3	4.4	5.0
53673	38.8N	112.7E	838	M	106	0	0	5	2.2	4.0	4.6
54115	43.6N	118.1E	800	M	106	0	0	16	2.7	4.1	4.9
54386	41.4N	128.2E	1018	M	106	0	0	47	2.0	4.4	4.8
56193	32.4N	104.5E	877	M	115	0	0	28	2.1	4.7	5.1
56287	30.0N	103.0E	629	M	115	0	0	3	1.8	4.1	4.5
56385	29.5N	103.3E	3049	S	113	0	0	55	2.2	-4.6	5.1
56462	29.0N	101.5E	2994	S	114	0	0	0	1.5	8.6	8.7

56768	25.0N	101.5E	1773	S	114	0	0	0	0.6	-5.6	5.6
57006	34.6N	105.8E	1143	M	106	0	0	2	2.1	4.6	5.1
57016	34.3N	107.1E	610	M	105	0	0	13	1.9	4.3	4.7
57816	26.6N	106.7E	1074	MS	115	110	96	0	0.5	-14.5	14.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	59	2	3	53	2.0	-4.9	5.3
82181	2.0S	54.1W	146	MS	83	0	0	0	1.1	6.8	6.9
82704	7.6S	72.7W	170	MS	70	0	0	3	1.8	-4.2	4.6
82765	7.3S	47.5W	193	MS	81	0	0	0	0.8	4.4	4.5
83235	12.4S	46.4W	604	MS	83	0	0	0	0.8	6.6	6.6
83332	14.1S	46.4W	826	MS	83	1	1	0	0.7	13.2	13.2
83470	17.9S	50.9W	727	MS	81	0	0	2	1.5	-5.5	5.7
83531	18.6S	46.5W	940	MS	85	0	0	0	0.8	-6.2	6.3
83738	22.5S	44.5W	440	MS	46	3	7	89	1.4	-12.7	12.8
83836	25.5S	50.6W	837	MS	85	1	1	0	0.7	-5.4	5.4
84401	5.2S	80.6W	49	MS	115	0	0	0	0.9	4.2	4.3
84425	5.9S	76.1W	179	MS	24	0	0	0	1.4	4.7	4.9
84455	6.5S	76.4W	281	MS	86	1	1	1	1.5	7.6	7.7
84472	7.1S	78.5W	2620	S	56	0	0	0	0.8	-5.3	5.4
84474	7.2S	76.7W	350	S	23	1	4	0	1.1	9.5	9.6
84686	13.6S	72.0W	3248	S	114	0	0	0	0.8	-5.0	5.1
84688	13.7S	73.4W	3444	S	48	1	2	0	0.5	-12.5	12.5
84720	14.9S	75.0W	567	MS	56	0	0	0	0.8	5.4	5.5
84782	18.1S	70.3W	468	MS	93	0	0	0	1.0	8.1	8.2
85140	14.3S	67.4W	140	MS	54	0	0	0	1.5	7.2	7.4
85210	16.3S	58.4W	124	MS	55	0	0	2	1.6	4.1	4.4
85264	18.5S	64.1W	1998	S	55	0	0	0	1.4	-5.2	5.4
85312	19.8S	63.9W	992	S	41	6	15	7	1.7	-11.0	11.1
85406	18.3S	70.3W	55	M	113	0	0	0	0.9	4.5	4.6
85432	22.5S	68.9W	2320	S8	74	0	0	3	1.4	4.5	4.7

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	111	0	0	19	2.2	7.4	7.7
71049	66.0N	91.8W	150	MS	113	102	90	0	1.1	13.8	13.8
71181	47.1N	55.3W	29	MS	113	0	0	0	0.6	-6.0	6.0
71408	47.4N	55.8W	35	S	112	0	0	4	1.1	-5.6	5.7
71475	49.3N	124.8W	2	MS	115	0	0	0	1.1	-7.9	8.0
71599	44.4N	65.2W	127	MS	115	0	0	0	0.6	-4.3	4.3
71747	48.8N	91.6W	424	MS	113	0	0	0	0.7	4.1	4.2
72327	36.1N	86.7W	182	MS	113	0	0	0	0.6	4.0	4.0
76055	31.0N	114.9W	440	MS	59	59	100	0			
76225	28.6N	106.1W	1435	MS	79	0	0	1	1.5	-4.4	4.6
76658	19.2N	103.7W	494	MS	26	0	0	0	0.6	5.2	5.2
76762	17.5N	99.5W	1265	MS	67	0	0	0	0.9	5.5	5.6
76903	14.9N	92.3W	118	MS	65	0	0	0	0.7	5.6	5.6
78588	17.2N	87.5W	20	M	115	103	90	0	0.5	-0.2	0.5

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	34	0	0	0	0.7	9.8	9.8
94130	14.8S	131.9E	120	MS	114	0	0	0	1.3	4.9	5.1
96505	3.7N	115.7E	-9999	8	33	33	100	0			
97378	10.7S	123.1E	1	S	38	36	95	0	13.7	-1.1	13.7

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	111	0	0	0	1.2	7.7	7.8
06605	47.1N	7.1E	1599	S8	115	0	0	3	1.0	-4.4	4.5
06685	47.0N	9.1E	515	MS	115	0	0	13	1.6	6.9	7.1
10850	48.8N	10.7E	457	MS	343	0	0	0	0.5	-5.8	5.8
11116	47.5N	10.8E	870	MS	58	1	2	0	0.8	4.5	4.6
13269	44.3N	19.9E	176	MS	112	1	1	1	0.8	7.8	7.8
14554	44.9N	18.4E	136	S	58	7	12	5	0.5	-13.7	13.7
16538	40.1N	9.3E	1022	S	36	0	0	0	0.8	8.9	8.9
17203	38.9N	40.5E	1177	S8	114	0	0	0	0.9	5.8	5.9
17310	36.6N	32.0E	6	MS	99	59	60	0	0.6	-0.2	0.6

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	96	0	0	0	1.2	-6.3	6.4
89253	63.2S	55.4W	75	M	201	0	0	0	2.7	4.7	5.4
89263	66.0S	66.1W	20	M	224	116	52	0	10.2	-3.4	10.8
89264	71.4S	68.9W	780	S	251	0	0	0	1.0	7.4	7.5
89272	75.0S	70.8W	1395	S	244	244	100	0			
89610	65.9S	113.1E	90	S	218	0	0	0	1.3	-7.8	7.9
89614	66.6S	111.2E	500	S	242	242	100	0			
89661	73.1S	169.6E	200	S	32	0	0	34	2.2	7.4	7.7
89666	76.7S	163.0E	200	S	34	33	97	3	0.0	13.0	13.0
89744	74.0S	43.1E	3353	S	268	0	0	0	0.9	7.5	7.6
89811	66.7S	112.8E	1366	S	232	0	0	0	1.1	-4.4	4.5

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3253	1	42	1.6	0.1	3235	0	41	0	7.3	0.7
AAL	5679	0	37	1.7	0.3	5468	0	37	0	7.4	0.2
AAR	1606	0	7	1.7	-0.4	1608	0	9	0	8.4	0.5
ACA	1601	1	7	1.6	-0.1	1532	0	8	0	8.6	0.6
ACI	102	0	7	0.9	0.1	102	0	7	0	4.8	0.8
AEA	1024	0	3	1.6	0.3	620	0	4	0	7.6	0.5
AEL	437	0	9	1.7	0.1	370	1	11	0	7.6	0.8
AEW	53	2	6	2.1	-0.9	50	0	4	0	10.1	1.2
AFL	346	1	3	1.8	0.4	310	1	3	0	6.8	1.2
AFR	1509	1	6	1.5	0.1	1226	0	8	0	8.4	0.3
AIS	27	0	11	1.9	0.7	27	0	7	0	6.1	0.8
AJM	355	0	2	1.3	-0.1	315	0	3	0	6.7	0.2
AJX	279	1	4	1.6	0.5	280	0	5	0	7.6	0.2
AMM	90	0	3	2.0	0.6	72	0	3	0	10.4	-0.4
AMT	1492	0	43	1.3	0.1	1492	0	44	0	7.5	-0.3
AMX	337	2	6	1.5	0.2	277	0	6	0	9.4	1.0
ANA	88	17	70	6.6	5.3	87	0	5	0	8.2	1.2
ANZ	4821	0	27	1.2	0.2	4798	0	27	0	6.0	0.7
ARG	39	5	36	2.1	0.1	37	0	30	0	9.9	2.6
ATN	141	0	100	3.9	-2.7	138	1	25	0	10.9	2.6
AVA	225	0	5	2.4	0.9	161	0	3	0	6.8	0.4
AVN	145	0	48	1.3	0.1	147	0	47	0	5.3	0.0
AXF	39	0	31	1.6	0.2	38	0	29	0	4.1	-0.2
AZA	548	1	14	2.8	1.0	471	0	7	0	8.8	0.5
BAL	363	0	6	1.3	0.3	324	0	10	0	8.2	0.2
BAW	643	1	14	1.8	-0.4	581	0	15	0	7.1	0.2
BBR	142	3	7	1.8	0.4	88	0	5	0	9.0	1.2
BHP	36	0	0	1.1	-0.4	33	0	0	0	5.3	0.1
BPA	278	27	100	5.7	4.3	240	1	12	0	9.0	0.1
BWA	178	0	2	1.5	-0.6	149	0	5	0	8.4	1.3
CAL	64	0	6	1.9	0.5	68	0	7	0	8.2	1.0
CCA	316	3	19	2.5	-0.1	335	0	53	0	12.8	-0.6
CES	263	2	6	1.7	0.3	260	0	8	0	10.8	1.2
CFC	39	0	5	1.6	-0.4	38	0	8	0	10.1	1.4
CFG	914	0	5	1.6	-0.2	824	0	6	0	7.5	0.3
CKK	124	2	8	1.6	0.5	127	2	13	0	9.7	-0.2
CKS	399	2	36	1.9	0.7	399	1	34	0	9.0	0.3
CLS	24	0	4	1.1	0.1	21	0	0	0	3.5	0.4
CLX	340	0	3	1.7	-0.4	287	0	5	0	7.0	0.1
COA	169	1	22	1.7	0.5	147	1	23	0	8.3	0.2
CPA	63	0	13	1.5	0.5	64	0	13	0	5.4	-0.2
CRL	540	1	4	1.6	0.6	451	0	5	0	9.2	0.2
CSN	94	0	11	2.0	-0.2	94	0	37	0	6.6	0.9
CUB	163	1	3	1.6	-0.2	144	0	4	0	8.3	0.2
DAL	2759	0	36	1.4	-0.1	2636	0	38	0	7.3	0.1
DCE	126	0	7	1.5	-1.0	113	0	10	0	8.7	0.1
DHL	110	2	100	6.4	-6.4	108	0	71	0	19.6	4.7
DLH	1038	0	15	1.5	0.0	1005	0	16	0	7.5	0.7
EDW	138	1	5	1.7	0.3	124	0	6	0	8.1	0.0
EEZ	59	3	12	2.1	0.3	54	0	11	0	12.5	-3.8
EIA	311	6	31	3.0	1.1	309	0	100	0	16.8	2.7
ELY	187	1	2	1.5	0.5	176	1	2	0	5.8	0.4
ETH	32	0	9	1.2	0.2	25	0	12	0	4.4	0.0
EVA	116	1	9	1.2	0.0	132	0	14	0	11.7	0.1
FDX	1714	0	43	1.6	0.4	1715	0	43	0	7.9	0.5
FIN	218	0	5	1.3	0.1	194	0	7	0	8.5	0.8
FJI	817	1	40	1.4	0.7	807	0	41	0	6.7	0.2
FOM	604	1	31	1.5	0.0	600	0	31	0	6.6	0.8
GAF	38	3	21	3.0	-1.7	38	3	18	0	7.1	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GCO	296	3	11	1.6	0.3	297	1	13	0	9.9	1.9
GHA	58	2	2	1.1	0.2	44	0	2	0	9.6	0.9
GRL	42	0	5	2.1	0.2	37	0	0	0	3.8	1.5
GTI	249	1	23	3.3	1.2	259	1	13	0	9.3	0.6
HAL	4398	0	40	1.3	0.1	4361	0	41	0	7.1	0.1
HLN	190	0	16	1.5	0.2	179	0	18	0	9.7	0.1
HRH	182	1	52	1.0	0.0	182	0	52	0	6.8	0.2
IBE	2966	1	5	1.5	0.3	2076	1	7	0	8.4	0.3
ICE	717	0	6	1.7	-0.2	670	0	5	0	8.7	0.7
IWD	248	1	6	1.4	0.2	172	1	6	0	6.7	0.6
JAA	101	0	4	2.1	0.9	101	0	3	0	7.1	3.8
JAL	2852	0	5	1.8	0.4	2832	0	6	0	8.6	0.4
JAZ	582	0	4	1.6	0.9	583	0	5	0	7.4	0.6
JBU	45	0	0	0.8	0.0	44	2	2	0	5.2	0.1
KAI	59	0	46	1.9	1.4	59	0	49	0	12.5	0.9
KAL	2405	0	8	1.7	0.1	2406	0	9	0	7.9	0.5
KIW	26	4	42	1.3	0.0	26	4	46	0	5.4	0.5
KLM	1516	0	6	1.8	0.2	1332	0	6	0	7.6	0.2
LAN	515	0	7	1.5	-0.2	513	0	8	0	5.9	1.4
LAP	86	5	47	2.4	1.3	84	0	45	0	9.0	2.1
LDA	72	0	29	3.6	1.9	64	0	5	0	6.0	1.0
LDI	413	1	41	1.4	-0.1	319	1	4	0	8.4	0.6
LNE	79	1	4	1.4	-0.3	43	0	0	0	6.9	-0.2
LOT	71	0	3	1.9	-1.3	63	0	3	0	5.1	0.1
LTU	969	1	6	1.5	0.0	791	0	5	0	7.7	0.7
LXJ	51	0	47	1.2	0.0	49	0	49	0	7.6	1.7
MAS	250	1	6	2.0	0.1	249	0	5	0	6.9	0.2
MON	73	0	41	2.0	0.7	64	0	5	0	9.4	0.4
MPD	193	1	4	1.5	0.5	140	0	4	0	6.8	0.9
MPH	654	0	3	1.7	-0.8	577	0	4	0	8.8	-0.1
MYT	263	1	7	1.8	-0.2	220	1	9	0	10.3	0.8
NAO	439	0	30	1.4	-0.2	448	0	30	0	7.5	0.3
NCA	975	1	5	1.7	0.2	729	0	5	0	8.1	0.2
NVR	32	3	6	0.9	0.0	32	0	6	0	8.6	1.3
NWA	6809	1	11	1.7	0.2	6753	0	11	0	7.8	0.4
NZL	3067	0	11	1.2	-0.1	3067	0	11	0	5.4	0.6
OAE	611	0	37	1.2	-0.3	605	0	44	0	10.6	0.9
PAC	473	1	12	1.8	0.4	470	0	13	0	8.7	0.5
PAL	1117	0	11	1.5	0.1	1078	0	14	0	9.0	0.7
PAO	295	0	49	1.1	0.1	295	0	50	0	8.2	1.3
PLM	230	0	5	1.8	0.8	137	1	7	0	8.4	0.6
PUA	28	7	39	1.5	0.9	27	0	37	0	11.1	3.1
QFA	3495	0	44	1.3	0.4	3490	0	44	0	5.5	0.2
QQA	80	0	51	1.7	-0.4	80	0	50	0	5.2	0.1
RAF	33	0	3	1.6	1.1	34	0	3	0	7.2	1.2
RAM	135	1	5	2.1	0.5	95	2	5	0	7.1	0.2
RCH	277	2	60	3.7	-0.5	227	0	58	0	13.0	1.4
RJA	27	0	4	1.5	-0.3	27	0	7	0	14.8	1.6
RRR	104	0	6	1.5	-0.1	95	0	9	0	7.5	1.2
RZO	339	1	4	1.6	-0.1	180	0	3	0	7.3	0.3
SAA	405	0	4	1.6	-0.6	339	0	6	0	9.2	0.6
SEU	237	2	10	2.0	0.2	223	0	6	0	7.7	-0.1
SHE	29	0	0	1.7	1.3	27	0	26	0	14.5	0.0
SIA	375	0	3	1.3	0.3	375	0	3	0	5.5	0.1
SLR	307	1	8	1.6	0.1	302	0	9	0	7.4	0.6
SQC	39	0	0	1.5	0.4	39	0	0	0	5.5	-0.4
SSV	36	0	0	0.9	-0.1	32	0	0	0	6.2	-0.4
TAG	25	0	20	2.3	-0.2	28	0	18	0	6.6	1.2
TAM	32	0	31	1.9	0.4	30	0	37	0	14.9	1.8

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAP	486	1	8	1.8	0.1	249	0	10	0	9.8	-0.4
TCX	126	1	3	1.5	0.5	110	0	4	0	8.0	0.1
THA	127	0	4	1.4	0.0	128	0	5	0	6.5	0.4
THT	92	0	39	1.4	0.3	82	0	44	0	16.8	-1.6
TSC	28	4	4	1.3	-0.9	29	0	0	0	5.2	0.6
UAE	512	1	5	1.4	0.3	511	0	4	0	4.7	0.5
UAL	131192	0	93	1.1	-0.2	131450	0	93	0	5.2	0.6
UPS	1706	0	52	1.6	0.1	1678	0	52	0	7.6	0.5
USA	216	3	3	1.3	0.1	169	0	4	0	8.1	0.4
VHF	23	0	0	0.9	0.1	24	0	0	0	6.2	2.1
VIR	170	1	5	1.5	-0.1	160	1	4	0	8.2	1.6
VRG	140	2	36	2.4	1.0	138	0	100	0	14.0	1.1
VVR	47	0	38	1.9	1.0	47	0	43	0	8.8	2.0
WOA	553	1	11	1.5	0.2	522	0	11	0	8.3	1.0
XLA	50	0	2	1.4	0.3	46	0	4	0	10.8	0.4
YSS	72	1	33	4.3	2.6	56	0	7	0	11.9	-1.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	41226	0	10	1.2	0.5	41229	0	10	0	4.9	0.4
EU	171693	0	23	1.2	0.3	171693	0	23	0	4.7	0.5
KL	1769	0	1	1.2	0.7	1769	0	1	0	5.5	0.2
MK	2735	0	7	1.5	1.2	2725	0	7	0	5.8	0.8
SA	3802	0	54	1.8	1.4	3655	0	6	0	6.3	0.6
TN	32	0	19	1.8	0.7	34	0	24	0	6.9	-0.1
N	820	1	24	2.2	0.5	834	0	24	0	7.7	1.0
US ACARS	805718	0	61	1.2	0.3	805711	0	61	0	5.3	0.7

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	321	1	40	1.8	0.0	310	0	39	0	8.8	0.0
ACA	29	0	28	3.3	-1.6	28	0	32	0	22.5	1.1
AFL	23	0	4	2.1	0.1	22	0	5	0	13.8	-2.8
AFR	79	0	8	1.4	-0.1	74	0	9	0	8.7	1.0
AMT	51	0	31	1.5	0.1	51	0	35	0	9.8	-0.2
ANZ	177	0	22	1.3	-0.2	178	1	22	0	4.6	0.0
AXF	43	0	60	1.0	0.5	39	5	69	0	14.3	-0.2
AZA	26	0	19	2.9	1.6	24	0	4	0	12.3	1.3
BAF	21	0	0	0.9	-0.1	21	0	0	0	6.1	0.3
CFC	37	0	3	1.4	-0.6	32	0	3	0	5.4	-0.9
CKS	36	0	19	1.8	0.7	35	0	29	0	15.6	-0.7
CRL	36	0	3	1.7	0.1	34	0	6	0	9.8	0.9
DAL	188	1	38	1.5	-0.2	183	0	41	0	8.9	0.9
DHL	28	0	100	6.9	-6.7	28	0	100	0	19.7	-2.3
DLH	280	0	9	1.5	-0.2	270	0	11	0	6.9	1.0
EIA	57	2	25	2.9	1.1	57	2	100	0	23.5	5.5
FDX	649	1	24	1.5	0.1	637	0	26	0	8.3	0.5
GCO	109	0	10	1.5	-0.1	106	0	16	0	9.6	1.1
GTI	34	0	6	1.6	-0.1	35	0	14	0	10.0	-0.6
HAL	272	2	44	1.4	0.2	272	0	43	0	7.2	2.1
IBE	28	4	21	2.4	-0.8	23	0	17	0	5.4	0.7
ICE	24	0	8	2.6	-1.5	23	0	4	0	13.5	0.2
JAL	129	1	4	1.6	0.4	130	0	7	0	8.9	1.6
JAZ	56	0	5	2.1	0.8	56	0	4	0	5.3	0.6
KAL	51	2	14	1.7	-0.5	51	0	12	0	8.7	-0.7
KIW	89	2	36	3.4	1.7	83	0	17	0	10.2	-0.3
KLM	45	0	0	1.5	-0.2	38	0	0	0	6.1	0.2
LAN	30	0	13	1.4	0.0	34	0	18	0	10.1	0.0
MAS	25	4	32	2.0	-0.7	25	0	32	0	9.1	-0.7
MPH	85	1	2	1.6	-0.7	80	0	3	0	6.1	0.3
NCA	103	0	1	1.3	0.3	88	0	2	0	6.5	-0.7
NWA	323	0	11	1.6	0.4	319	0	12	0	7.7	-0.8
NZL	16207	0	54	1.3	0.2	16206	0	54	0	5.2	0.2
OAE	51	0	47	1.1	0.0	51	0	47	0	7.9	-1.1
PAC	79	0	5	1.8	-0.1	76	0	4	0	9.2	0.3
PAL	32	0	13	0.9	-0.2	32	0	16	0	7.7	-0.6
QFA	211	0	45	1.1	0.2	214	0	44	0	6.6	1.0
RRR	125	17	31	3.0	1.9	123	0	24	0	13.8	0.3
SAA	37	11	14	1.9	-0.8	37	0	0	0	4.7	-1.6
SIA	50	0	0	1.2	0.5	52	0	0	0	5.0	1.1
SKI	23	9	52	3.9	-1.6	26	0	35	0	17.8	2.1
UAE	63	0	2	1.0	0.4	64	0	2	0	5.5	0.7
UAL	280757	0	99	1.2	-0.1	280629	0	99	0	4.6	0.3
UPS	293	2	49	1.4	-0.2	290	1	50	0	9.4	0.2
VVR	28	18	39	3.9	-3.1	25	0	16	0	6.9	1.0
WOA	189	0	10	2.1	-0.4	185	2	11	0	9.8	1.5

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	33092	0	49	1.2	0.2	33094	0	49	0	4.1	0.0
EU	588458	0	68	1.1	0.2	588361	0	68	0	3.9	0.0
KL	1093	0	53	1.8	0.0	1093	0	53	0	5.5	0.0
MK	1759	0	51	1.5	0.7	1738	0	51	0	4.6	1.0
SA	2302	0	73	1.9	0.5	2242	0	56	0	4.6	0.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	33	0	15	1.9	0.2	39	0	15	0	7.9	1.9
US ACARS	1561715	0	77	1.2	0.3	1557585	0	78	0	4.4	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 41234

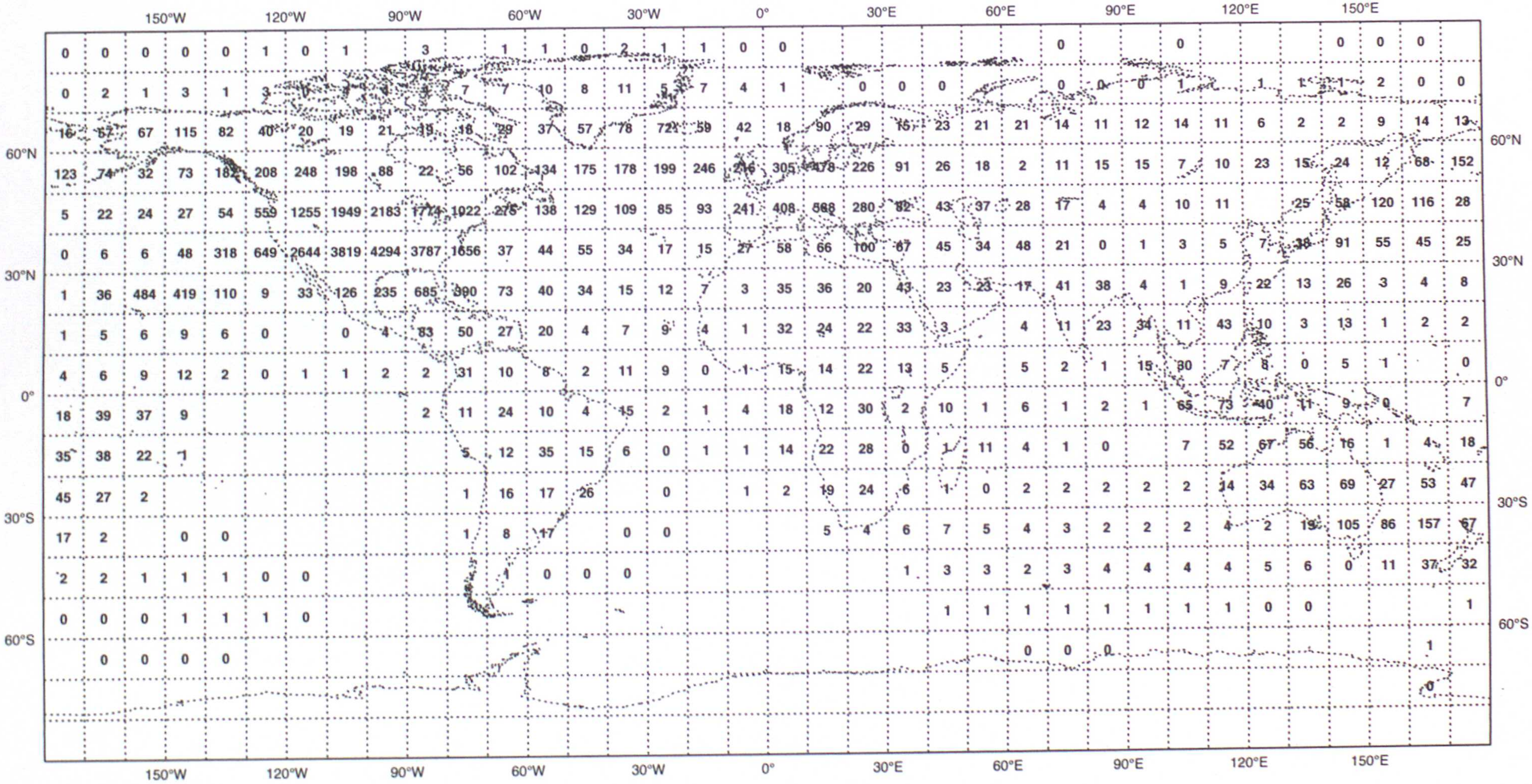

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 1 0 1 3 1 1 0 2 1 1 0 0 0 0 0 0 0
0 2 1 3 1 3 0 [illegible] 4 3 7 7 10 8 11 5 7 4 1 0 0 0 0 0 0 1 1 1 1 2 0 0
16 57 67 115 82 40 20 19 21 15 18 29 37 57 78 72 59 42 18 90 29 15 23 21 21 14 11 12 14 11 6 2 2 9 14 13
123 74 32 73 182 208 248 198 88 22 56 102 134 175 178 199 246 216 305 478 226 91 26 18 2 11 15 15 7 10 23 15 24 12 68 152
5 22 24 27 54 559 1255 1949 2183 1774 1022 276 138 129 109 85 93 241 408 588 280 82 43 37 28 17 4 4 10 11 25 58 120 116 28
0 6 6 48 318 649 2644 3819 4294 3787 1656 37 44 55 34 17 15 27 58 66 100 67 45 34 48 21 0 1 3 5 7 38 91 55 45 25
1 36 484 419 110 9 33 126 235 685 390 73 40 34 15 12 7 3 35 36 20 43 23 23 17 41 38 4 1 9 22 13 26 3 4 8
1 5 6 9 6 0 0 4 83 50 27 20 4 7 9 4 1 32 24 22 33 3 4 11 23 34 11 43 10 3 13 1 2 2
4 6 9 12 2 0 1 1 2 2 31 10 8 2 11 9 0 1 15 14 22 13 5 5 2 1 15 30 7 8 0 5 1 0
18 39 37 9 2 11 24 10 4 15 2 1 4 18 12 30 2 10 1 6 1 2 1 65 73 40 11 9 0 7
35 38 22 1 5 12 35 15 6 0 1 1 14 22 28 0 1 11 4 1 0 7 52 67 56 16 1 4 18
45 27 2 1 16 17 26 0 1 2 19 24 6 1 0 2 2 2 2 2 14 34 63 69 27 53 47
17 2 0 0 1 8 17 0 0 5 4 6 7 5 4 3 2 2 2 4 2 19 105 86 157 67
2 2 1 1 1 0 0 1 0 0 0 1 3 3 2 3 4 4 4 4 5 6 0 11 37 32
0 0 0 1 1 1 0 1 1 1 1 1 1 1 1 0 0 1
0 0 0 0 0 0 0 1
0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 82849

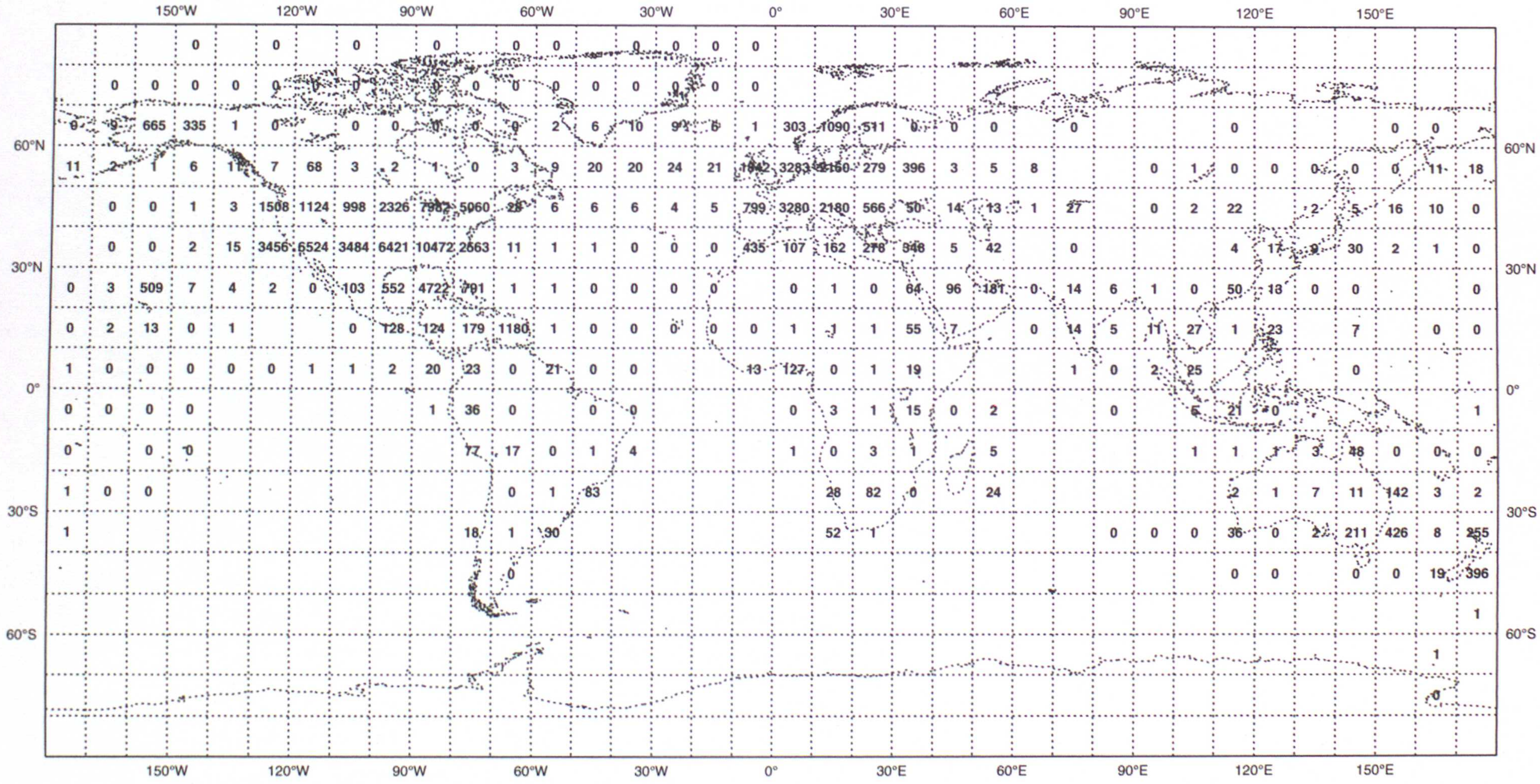

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 9 665 335 1 0 0 0 0 0 0 2 6 10 9 6 1 303 1090 511 0 0 0 0 0 0 0
11 2 1 6 11 7 68 3 2 1 0 3 9 20 20 24 21 1842 3283 3150 279 396 3 5 8 0 1 0 0 0 0 0 11 18
0 0 1 3 1508 1124 998 2326 7982 5060 28 6 6 6 4 5 799 3280 2180 566 50 14 13 1 27 0 2 22 2 5 16 10 0
0 0 2 15 3456 6524 3484 6421 10472 2663 11 1 1 0 0 0 435 107 162 278 348 5 42 0 4 17 9 30 2 1 0
0 3 509 7 4 2 0 103 552 4722 701 1 1 0 0 0 0 0 1 0 64 96 181 0 14 6 1 0 50 18 0 0 0
0 2 13 0 1 0 128 124 179 1180 1 0 0 0 0 0 1 1 1 55 7 0 14 5 11 27 1 23 7 0 0
1 0 0 0 0 0 1 1 2 20 23 0 21 0 0 13 127 0 1 19 1 0 2 25 0
0 0 0 0 1 36 0 0 0 0 3 1 15 0 2 0 5 21 0 1
0 0 0 77 17 0 1 4 1 0 3 1 5 1 1 1 3 48 0 0 0
1 0 0 0 1 83 28 82 0 24 2 1 7 11 142 3 2
1 18 1 30 52 1 0 0 0 36 0 2 211 426 8 255
0 0 0 0 0 19 396
1
1
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

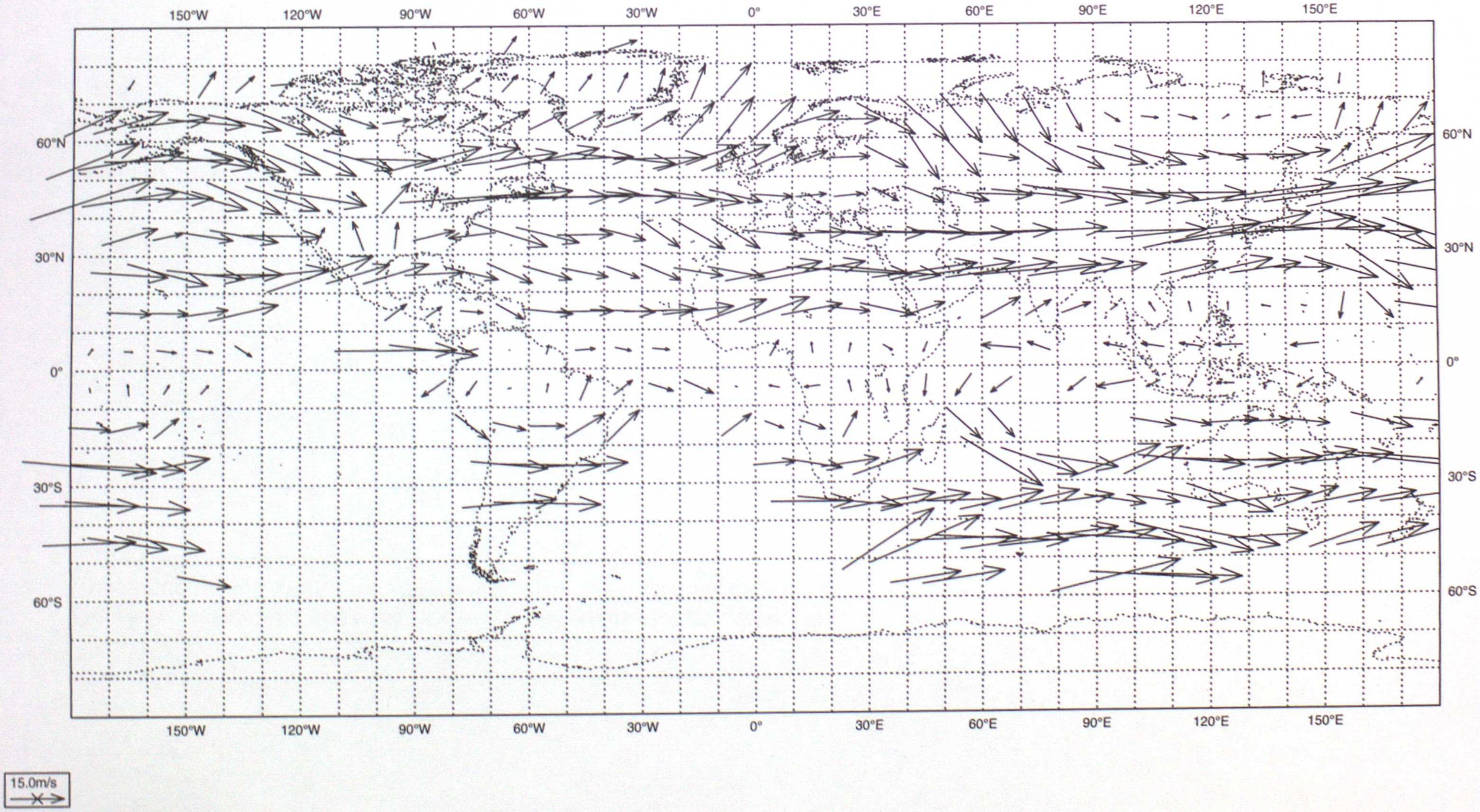

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

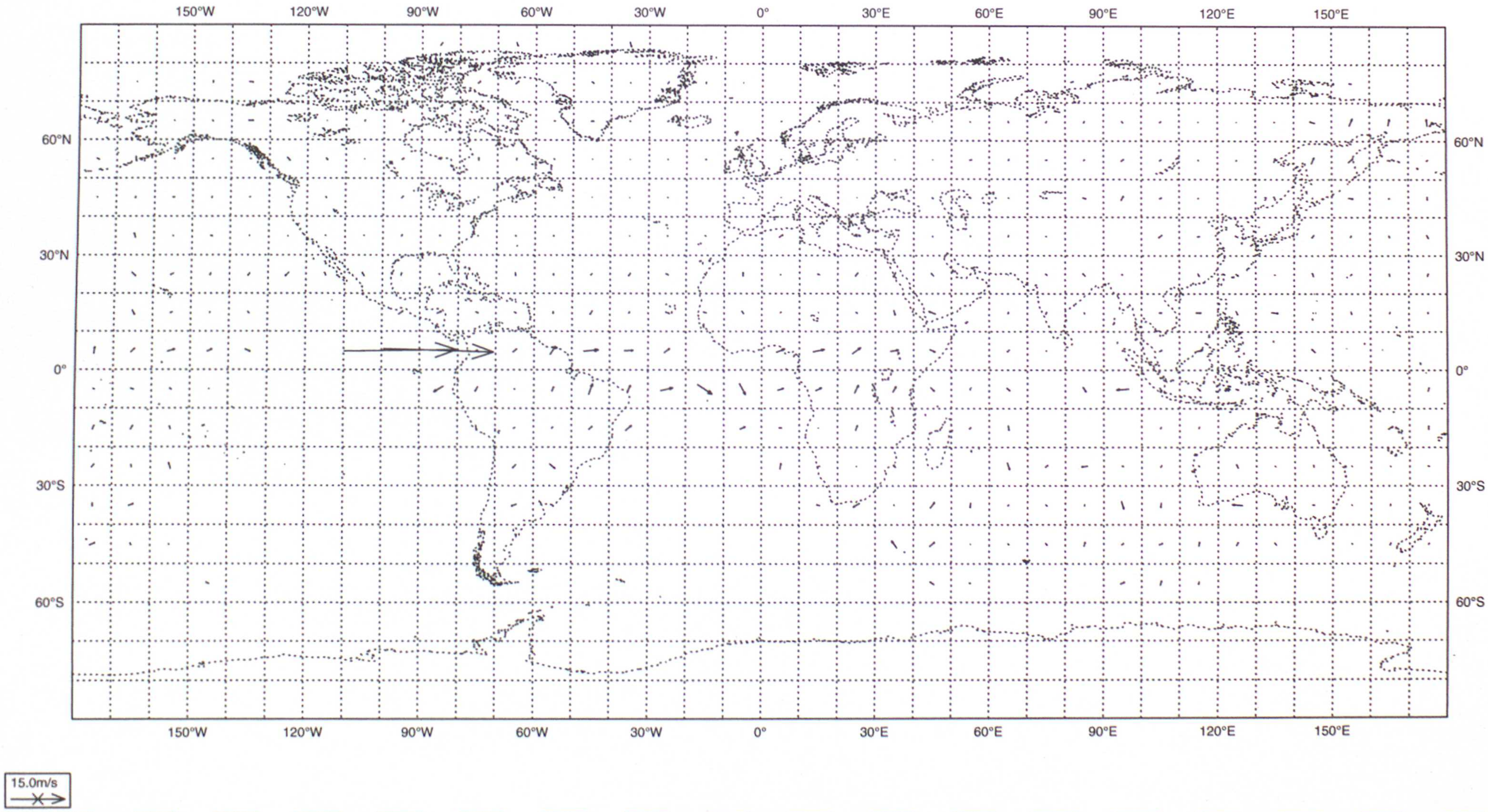

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

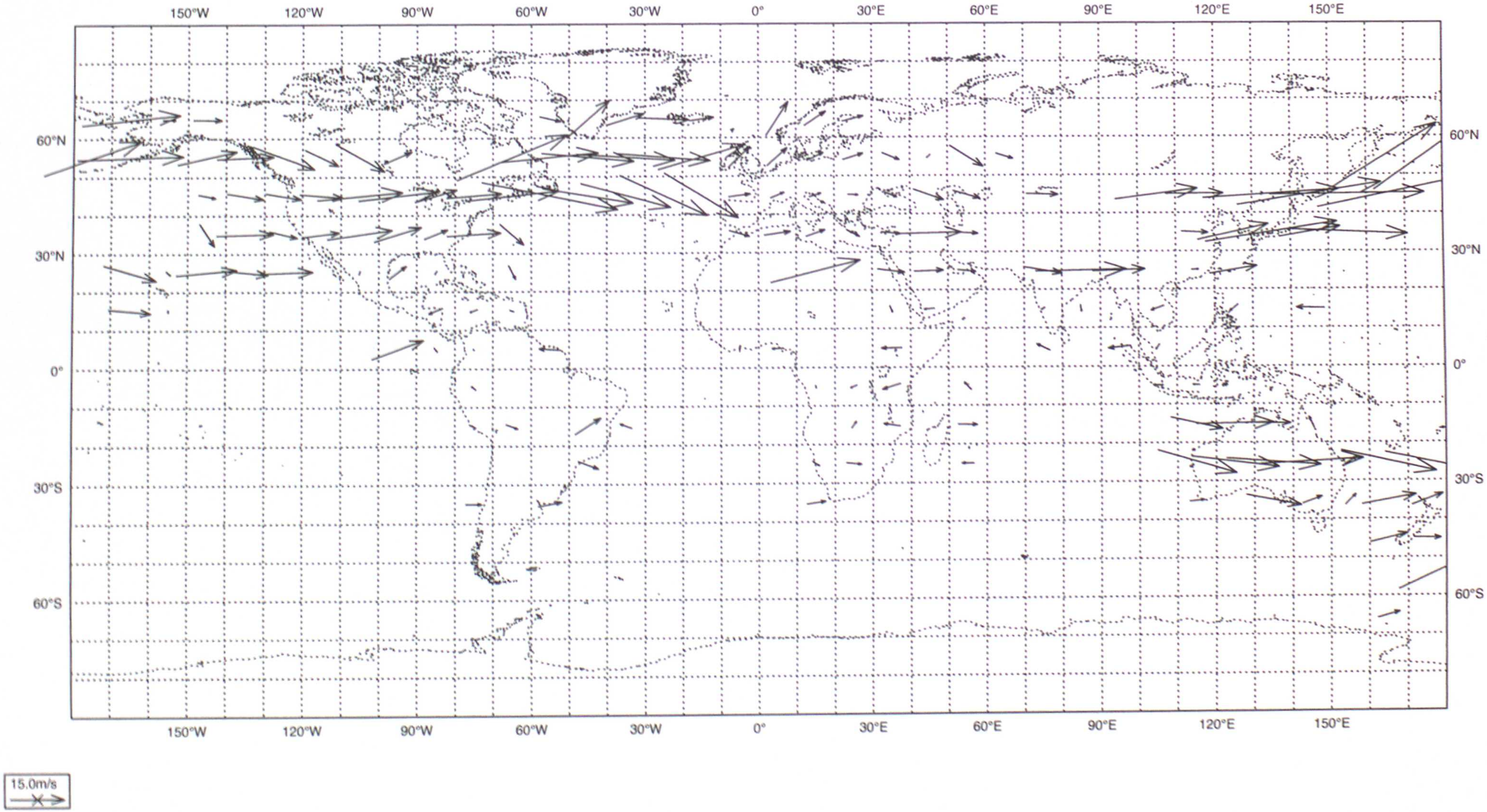

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

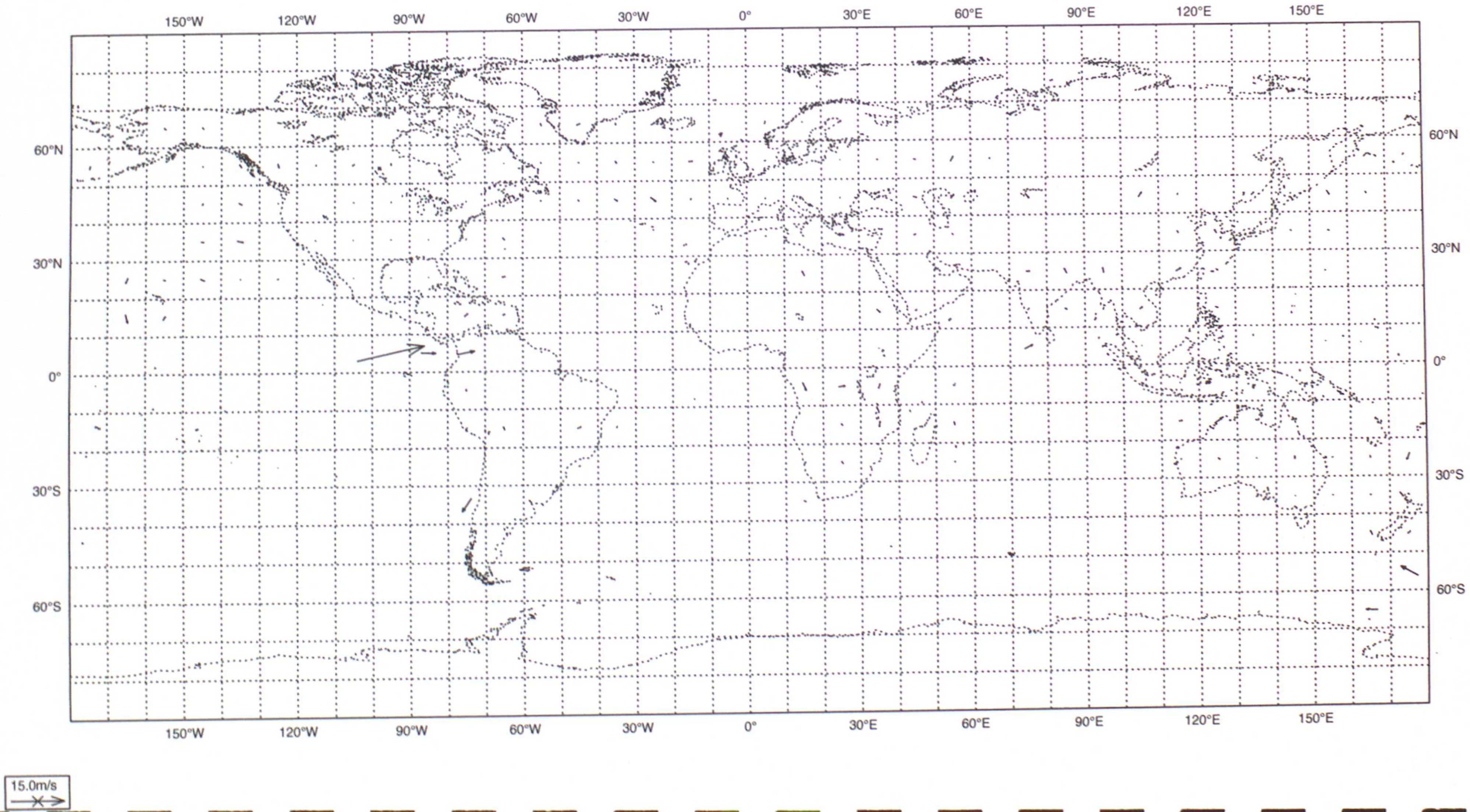

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

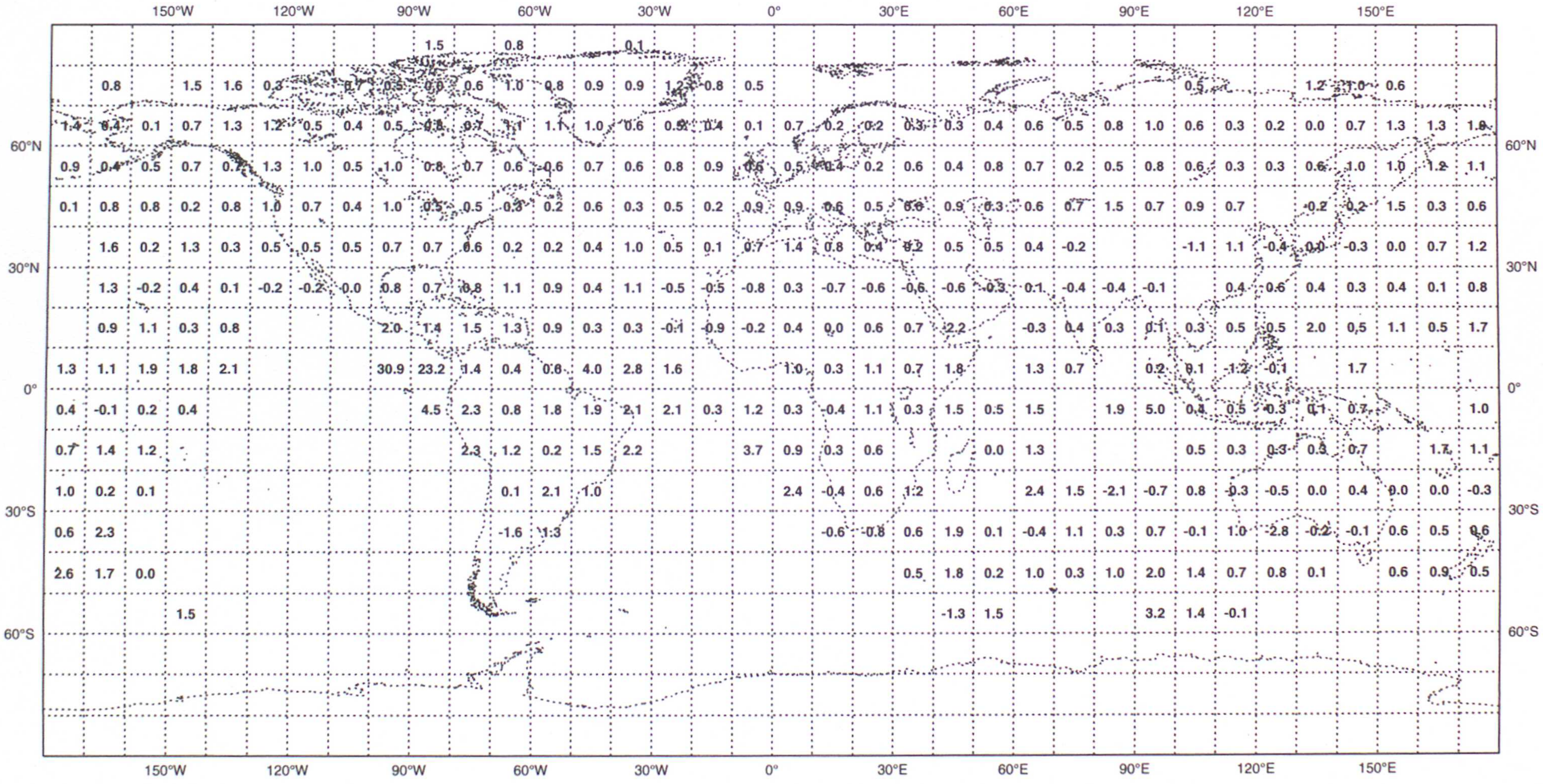

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

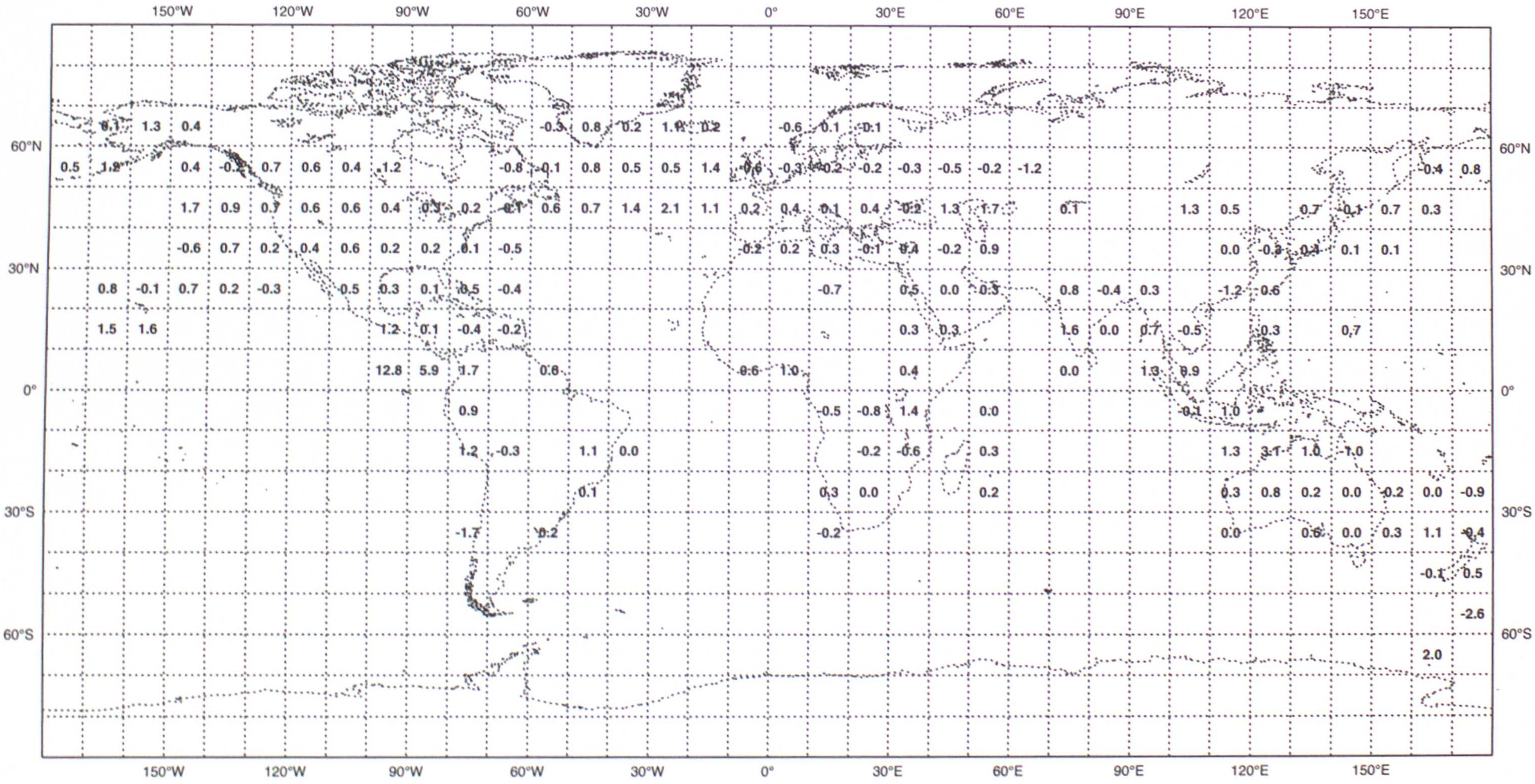

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.1 1.3 0.4 -0.3 0.8 0.2 1.9 0.2 -0.6 0.1 -0.1
0.5 1.8 0.4 -0.2 0.7 0.6 0.4 1.2 -0.8 -0.1 0.8 0.5 0.5 1.4 0.6 -0.3 -0.2 -0.2 -0.3 -0.5 -0.2 -1.2 -0.4 0.8
1.7 0.9 0.7 0.6 0.6 0.4 0.3 0.2 -0.1 0.6 0.7 1.4 2.1 1.1 0.2 0.4 0.1 0.4 -0.2 1.3 1.7 0.1 1.3 0.5 0.7 -0.1 0.7 0.3
-0.6 0.7 0.2 0.4 0.6 0.2 0.2 0.1 -0.5 -0.2 0.2 0.3 -0.1 0.4 -0.2 0.9 0.0 -0.3 0.4 0.1 0.1
0.8 -0.1 0.7 0.2 -0.3 -0.5 0.3 0.1 0.5 -0.4 -0.7 0.5 0.0 0.3 0.8 -0.4 0.3 -1.2 0.6
1.5 1.6 1.2 0.1 -0.4 -0.2 0.3 0.3 1.6 0.0 0.7 -0.5 0.3 0.7
12.8 5.9 1.7 0.6 0.6 1.0 0.4 0.0 1.3 0.9
0.9 -0.5 -0.8 1.4 0.0 -0.1 1.0
1.2 -0.3 1.1 0.0 -0.2 -0.6 0.3 1.3 3.1 1.0 -1.0
0.1 0.3 0.0 0.2 0.3 0.8 0.2 0.0 -0.2 0.0 -0.9
-1.7 0.2 -0.2 0.0 0.6 0.0 0.3 1.1 -0.4
-0.1 0.5
-2.6
2.0

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

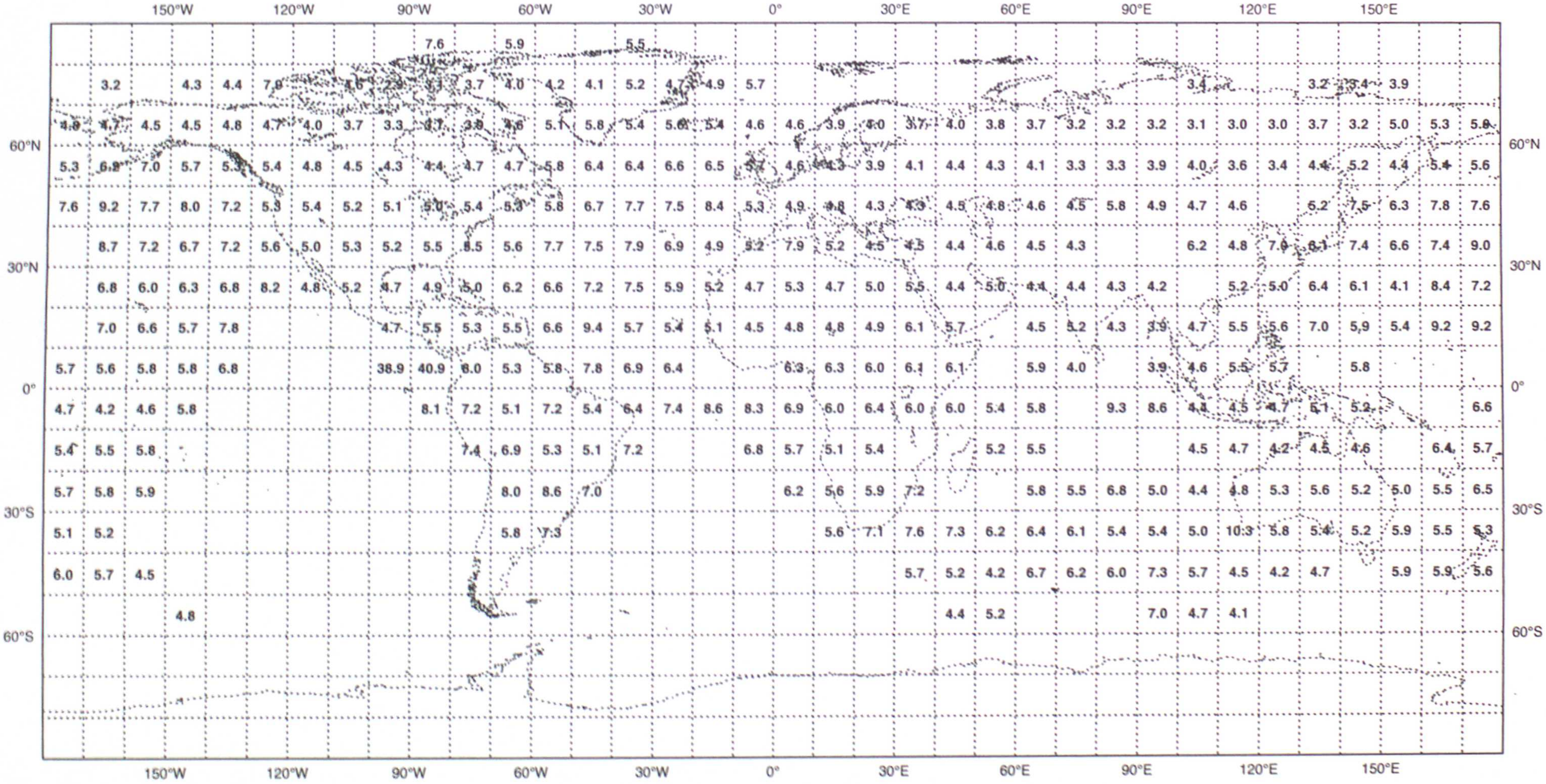

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
7.6 5.9 5.5
3.2 4.3 4.4 7.9 4.6 2.9 3.1 3.7 4.0 4.2 4.1 5.2 4.7 4.9 5.7 3.4 3.2 3.4 3.9
4.9 4.7 4.5 4.5 4.8 4.7 4.0 3.7 3.3 3.7 3.9 4.6 5.1 5.8 5.4 5.6 5.4 4.6 4.6 3.9 4.0 3.7 4.0 3.8 3.7 3.2 3.2 3.2 3.1 3.0 3.0 3.7 3.2 5.0 5.3 5.8
5.3 6.8 7.0 5.7 5.3 5.4 4.8 4.5 4.3 4.4 4.7 4.7 5.8 6.4 6.4 6.6 6.5 5.7 4.6 4.3 3.9 4.1 4.4 4.3 4.1 3.3 3.3 3.9 4.0 3.6 3.4 4.4 5.2 4.4 5.4 5.6
7.6 9.2 7.7 8.0 7.2 5.3 5.4 5.2 5.1 5.0 5.4 5.3 5.8 6.7 7.7 7.5 8.4 5.3 4.9 4.8 4.3 4.3 4.5 4.8 4.6 4.5 5.8 4.9 4.7 4.6 6.2 7.5 6.3 7.8 7.6
8.7 7.2 6.7 7.2 5.6 5.0 5.3 5.2 5.5 8.5 5.6 7.7 7.5 7.9 6.9 4.9 5.2 7.9 5.2 4.5 4.5 4.4 4.6 4.5 4.3 6.2 4.8 7.0 6.1 7.4 6.6 7.4 9.0
6.8 6.0 6.3 6.8 8.2 4.8 5.2 4.7 4.9 5.0 6.2 6.6 7.2 7.5 5.9 5.2 4.7 5.3 4.7 5.0 5.5 4.4 5.0 4.4 4.4 4.3 4.2 5.2 5.0 6.4 6.1 4.1 8.4 7.2
7.0 6.6 5.7 7.8 4.7 5.5 5.3 5.5 6.6 9.4 5.7 5.4 5.1 4.5 4.8 4.8 4.9 6.1 5.7 4.5 5.2 4.3 3.9 4.7 5.5 5.6 7.0 5.9 5.4 9.2 9.2
5.7 5.6 5.8 5.8 6.8 38.9 40.9 6.0 5.3 5.8 7.8 6.9 6.4 6.3 6.3 6.0 6.1 6.1 5.9 4.0 3.9 4.6 5.5 5.7 5.8
4.7 4.2 4.6 5.8 8.1 7.2 5.1 7.2 5.4 6.4 7.4 8.6 8.3 6.9 6.0 6.4 6.0 6.0 5.4 5.8 9.3 8.6 4.4 4.5 4.7 6.1 5.2 6.6
5.4 5.5 5.8 7.4 6.9 5.3 5.1 7.2 6.8 5.7 5.1 5.4 5.2 5.5 4.5 4.7 4.2 4.5 4.6 6.4 5.7
5.7 5.8 5.9 8.0 8.6 7.0 6.2 5.6 5.9 7.2 5.8 5.5 6.8 5.0 4.4 4.8 5.3 5.6 5.2 5.0 5.5 6.5
5.1 5.2 5.8 7.3 5.6 7.1 7.6 7.3 6.2 6.4 6.1 5.4 5.4 5.0 10.3 5.8 5.4 5.2 5.9 5.5 5.3
6.0 5.7 4.5 5.7 5.2 4.2 6.7 6.2 6.0 7.3 5.7 4.5 4.2 4.7 5.9 5.9 5.6
4.8 4.4 5.2 7.0 4.7 4.1

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). NOVEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

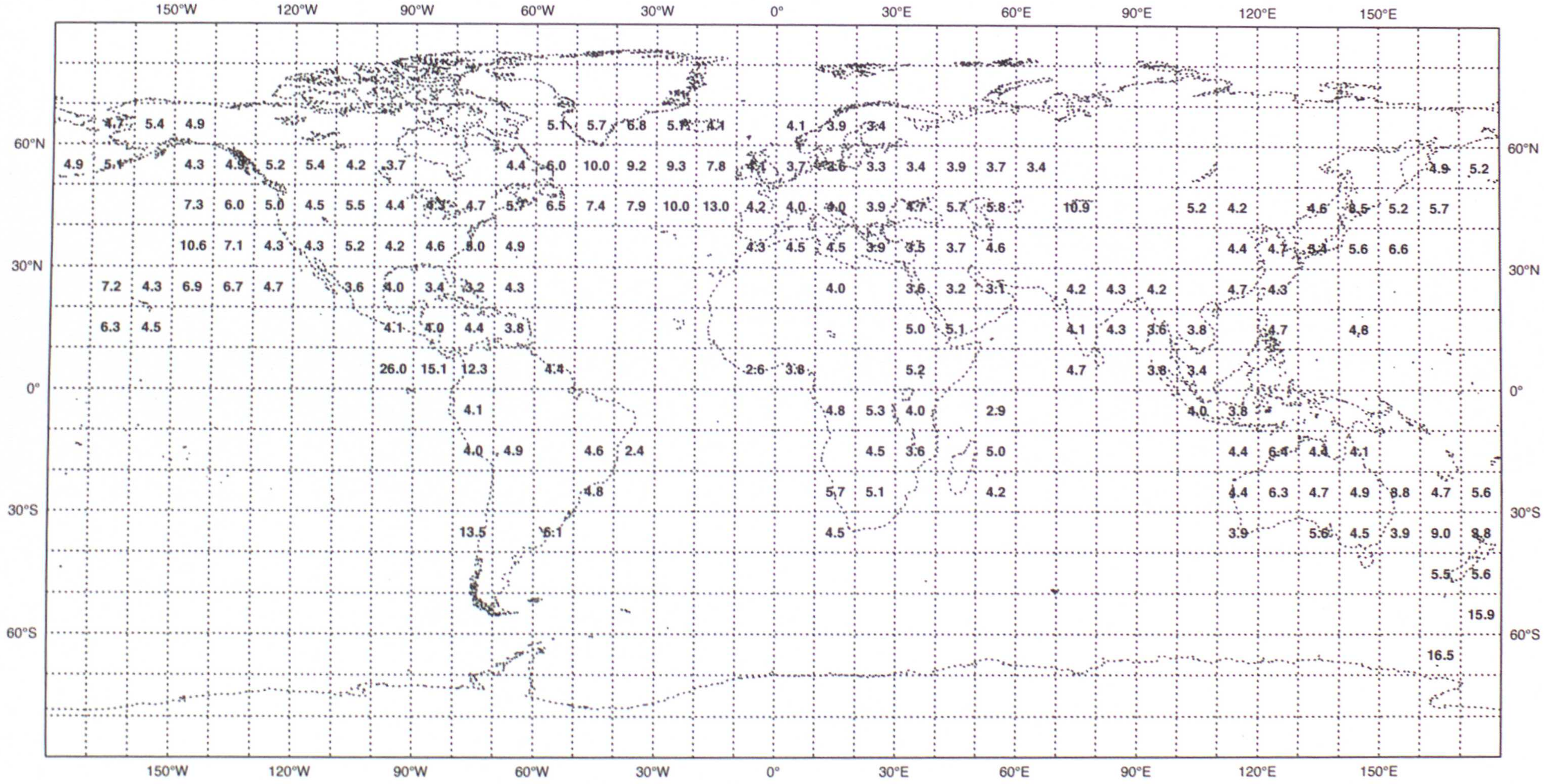

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.7 5.4 4.9 5.1 5.7 6.8 5.1 4.1 4.1 3.9 3.4
4.9 5.1 4.3 4.9 5.2 5.4 4.2 3.7 4.4 6.0 10.0 9.2 9.3 7.8 4.1 3.7 3.6 3.3 3.4 3.9 3.7 3.4 4.9 5.2
7.3 6.0 5.0 4.5 5.5 4.4 4.3 4.7 5.7 6.5 7.4 7.9 10.0 13.0 4.2 4.0 4.0 3.9 4.7 5.7 5.8 10.9 5.2 4.2 4.6 8.5 5.2 5.7
10.6 7.1 4.3 4.3 5.2 4.2 4.6 8.0 4.9 4.3 4.5 4.5 3.9 3.5 3.7 4.6 4.4 4.7 5.4 5.6 6.6
7.2 4.3 6.9 6.7 4.7 3.6 4.0 3.4 3.2 4.3 4.0 3.6 3.2 3.1 4.2 4.3 4.2 4.7 4.3
6.3 4.5 4.1 4.0 4.4 3.8 5.0 5.1 4.1 4.3 3.6 3.8 4.7 4.8
26.0 15.1 12.3 4.4 2.6 3.8 5.2 4.7 3.8 3.4
4.1 4.8 5.3 4.0 2.9 4.0 3.8
4.0 4.9 4.6 2.4 4.5 3.6 5.0 4.4 6.4 4.4 4.1
4.8 5.7 5.1 4.2 4.4 6.3 4.7 4.9 8.8 4.7 5.6
13.5 6.1 4.5 3.9 5.6 4.5 3.9 9.0 8.8
5.5 5.6
15.9
16.5

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20744	00	Z	150	72/ 53	7	8	94.6	156.1	182.5	6
24125	12	Z	1000	68/ 112	10	17	24.0	-48.7	54.3	4
29839	12	Z	250	53/ 84	13	0	83.0	-3.8	83.1	4
42027	12	Z	250	34/ 75	17	0	55.1	52.8	76.3	4
42101	00	Z	150	30/ 76	23	0	102.8	-32.3	107.7	4
42101	12	Z	50	30/ 76	14	0	149.4	51.4	158.0	5
42182	00	Z	1000	29/ 77	12	11	8.9	-83.3	83.8	10
42182	12	Z	1000	29/ 77	11	18	6.4	-92.8	93.0	10
42361	00	Z	1000	26/ 78	18	5	11.9	-76.1	77.0	6
42361	12	Z	1000	26/ 78	13	10	9.8	-85.5	86.0	6
42369	12	Z	250	27/ 81	13	1	70.3	-89.5	113.8	6
42397	12	Z	500	27/ 88	25	0	42.4	-29.0	51.4	5
42410	00	Z	1000	26/ 92	15	11	9.2	-85.7	86.2	4
42410	12	Z	1000	26/ 92	2	24	0.5	-98.5	98.5	5
42492	00	Z	250	26/ 85	25	0	68.2	-40.0	79.1	4
42492	12	Z	200	26/ 85	25	1	78.0	-79.0	111.0	7
42701	00	Z	50	23/ 85	10	0	128.8	63.6	143.6	5
42809	00	Z	150	23/ 88	27	0	91.0	-50.4	104.1	7
43003	00	Z	1000	19/ 73	27	0	10.9	-54.3	55.4	12
43003	12	Z	1000	19/ 73	25	0	11.7	-64.1	65.2	8
43014	00	Z	150	20/ 75	16	1	112.5	-2.4	112.5	6
43014	12	Z	200	20/ 75	20	0	86.3	28.5	90.9	7
43185	00	Z	30	16/ 81	13	0	101.4	202.2	226.2	4
43192	00	Z	1000	15/ 74	9	16	20.5	-76.0	78.7	8
43192	12	Z	1000	15/ 74	4	22	18.1	-87.3	89.1	10
43311	00	Z	200	11/ 73	23	0	86.2	-62.4	106.4	4
43333	12	Z	150	12/ 93	28	0	70.4	-99.6	122.0	5
43346	00	Z	50	11/ 80	14	1	98.9	126.3	160.4	4
58968	00	Z	30	25/ 122	21	2	30.9	233.1	235.2	4
67083	12	Z	250	-19/ 47	1	0	0.0	-130.0	130.0	5
78866	12	Z	850	18/ -63	23	0	26.0	27.7	38.0	6
89592	00	Z	30	-67/ 93	25	1	59.2	193.3	202.2	4
89592	12	Z	50	-67/ 93	14	0	63.6	187.1	197.7	6
96163	00	Z	1000	-1/ 100	4	6	75.1	-43.8	86.9	4
97180	00	Z	100	-5/ 120	11	1	109.9	-19.6	111.6	4

Figure 8. TEMP 500 hPa geopotential mean daily count. NOVEMBER 2003
All hours
Global average number of observations in 24 hours = 1108

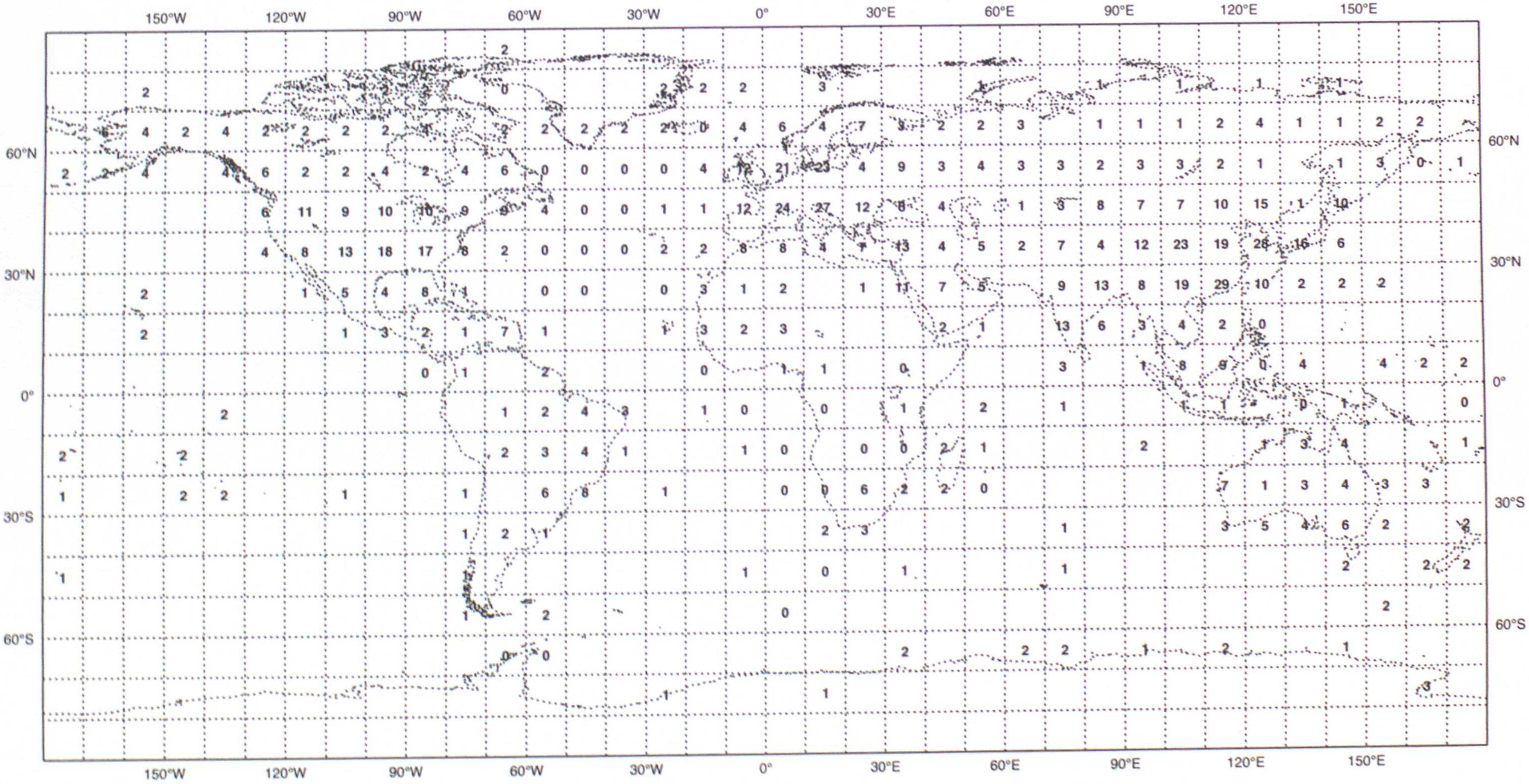

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
40265	00	V	250	32/ 36	20	0	5	-1.9	-3.8	16.4	2
40809	12	V	300	33/ 59	12	0	100	-4.5	-1.6	15.3	1
41170	00	V	300	25/ 52	12	0	8	4.0	-0.2	16.4	1
42182	00	V	150	29/ 77	10	0	100	-10.5	-14.0	23.9	4
42182	12	V	200	29/ 77	18	0	100	-16.3	-13.8	25.8	3
42369	00	V	500	27/ 81	22	0	45	5.6	-3.7	16.3	1
42410	00	V	300	26/ 92	12	0	33	3.7	5.8	15.2	2
42410	12	V	300	26/ 92	10	0	40	7.4	5.7	18.8	2
47102	00	V	200	38/ 125	22	0	9	-6.9	1.8	19.4	4
47102	12	V	250	38/ 125	26	0	11	-6.2	2.5	19.9	4
56691	12	V	200	27/ 104	28	0	17	-7.5	-5.7	15.5	2
60360	12	V	200	37/ 8	16	0	100	8.9	6.9	21.3	2
60566	12	V	200	32/ 4	10	0	100	-10.4	5.1	20.8	2
60620	12	V	250	28/ 0	11	0	100	-12.4	6.7	25.8	2
62337	00	V	200	31/ 34	25	0	100	-7.4	11.5	16.0	3
62378	00	V	200	30/ 31	28	0	100	-13.5	-2.0	16.8	2
62378	12	V	150	30/ 31	26	0	100	-9.2	-0.6	16.4	2
62423	12	V	300	27/ 28	11	0	9	-3.5	0.7	19.2	1
68442	12	V	250	-29/ 26	11	0	100	-13.3	-1.6	17.2	1
68512	12	V	200	-30/ 18	20	0	100	-11.6	-1.2	16.4	1
72376	12	V	250	37/-108	20	0	100	-4.9	-0.2	16.7	1
91843	00	V	200	-21/-160	10	0	10	-1.5	-6.9	16.3	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. NOVEMBER 2003
All hours
Global average number of observations in 24 hours = 1279

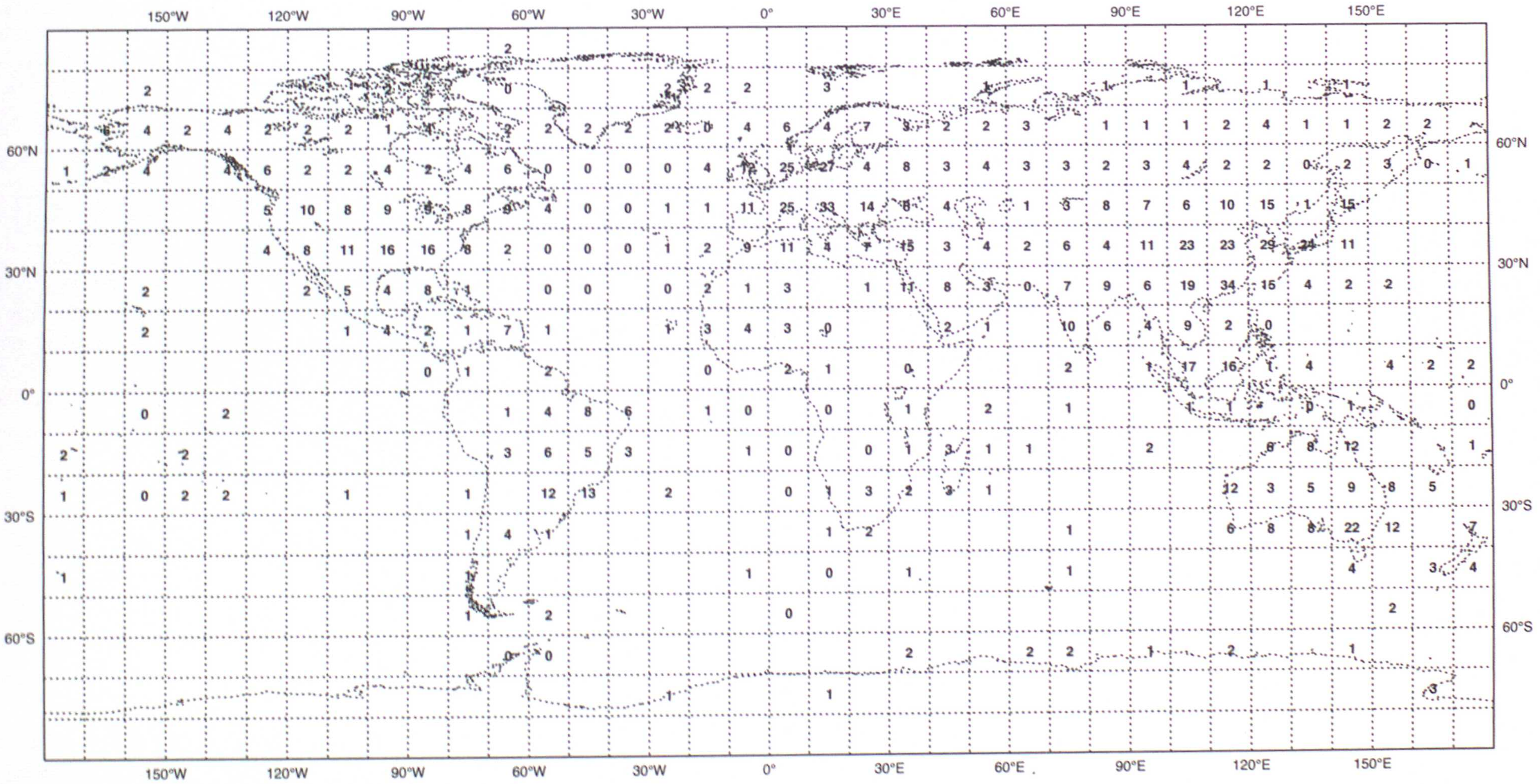

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	24	-11.4	3.1	9.3
42027	12	DD	34/ 75	8	-21.6	9.6	9.6
42397	12	DD	27/ 88	5	13.1	9.9	9.9
43371	00	DD	8/ 77	17	10.0	7.9	21.7
43371	12	DD	8/ 77	17	12.4	9.9	24.3
59758	00	DD	20/ 110	22	11.2	4.1	14.4
62337	00	DD	31/ 34	24	-23.4	4.7	8.2
62337	12	DD	31/ 34	23	-23.3	4.4	7.5
89009	00	DD	-90/ 0	13	-10.3	9.1	16.1
96749	00	DD	-6/ 107	7	-20.3	8.6	27.0

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Nov 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. NOVEMBER 2003
Global average number of observations in 24 hours = 81085

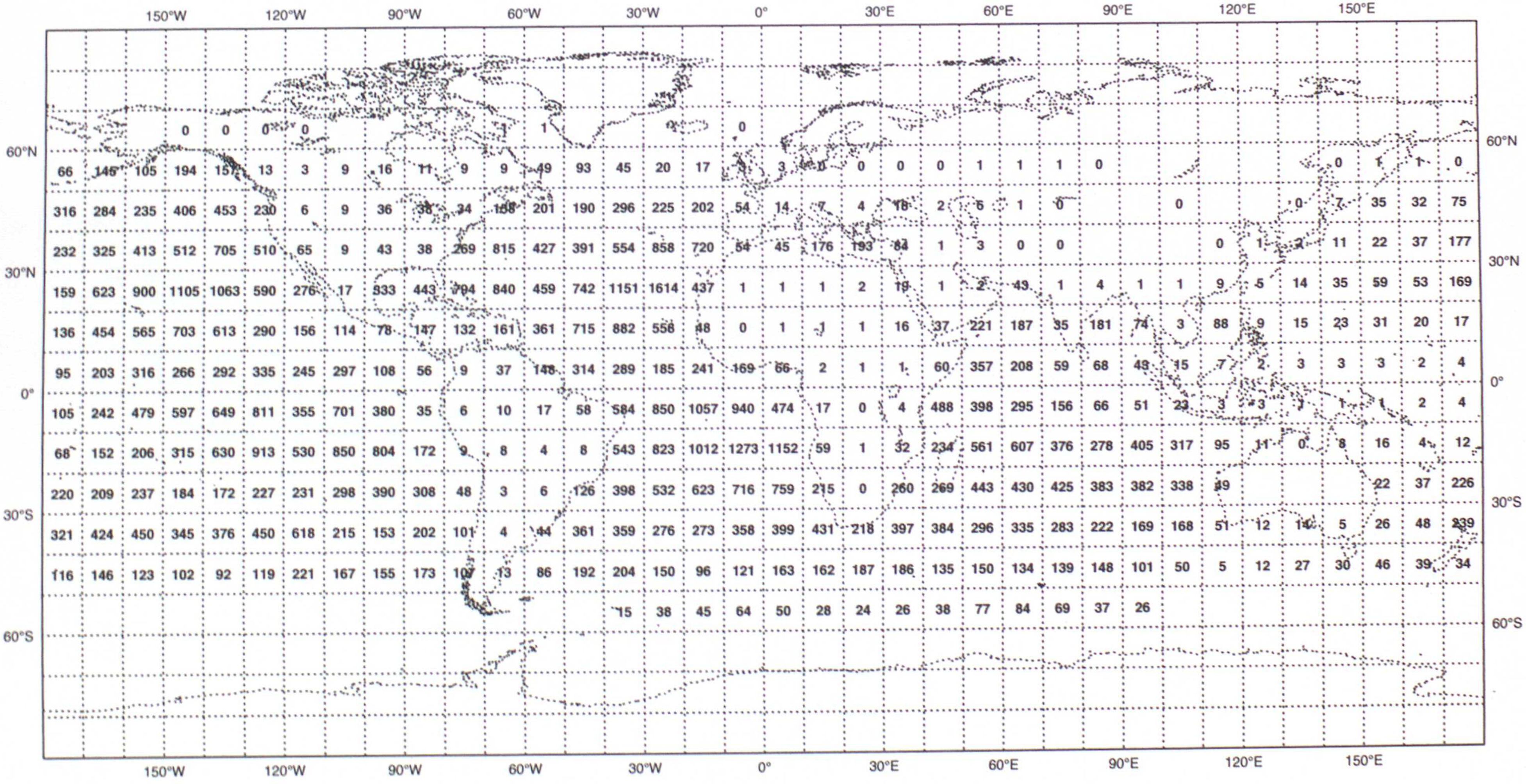

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 1 1 0
66 146 105 194 157 13 3 9 16 11 9 9 49 93 45 20 17 3 0 0 0 0 1 1 1 0 0 1 1 0
316 284 235 406 453 230 6 9 36 38 34 158 201 190 296 225 202 54 14 7 4 18 2 6 1 0 0 0 7 35 32 75
232 325 413 512 705 510 65 9 43 38 269 815 427 391 554 858 720 54 45 176 193 84 1 3 0 0 0 1 2 11 22 37 177
159 623 900 1105 1063 590 276 17 333 443 704 840 459 742 1151 1614 437 1 1 1 2 19 1 2 43 1 4 1 1 9 5 14 35 59 53 169
136 454 565 703 613 290 156 114 78 147 132 161 361 715 882 558 48 0 1 1 1 16 37 221 187 35 181 74 3 88 9 15 23 31 20 17
95 203 316 266 292 335 245 297 108 56 9 37 148 314 289 185 241 169 66 2 1 1 60 357 208 59 68 48 15 7 2 3 3 3 2 4
105 242 479 597 649 811 355 701 380 35 6 10 17 58 584 850 1057 940 474 17 0 4 488 398 295 156 66 51 23 3 3 1 1 1 2 4
68 152 206 315 630 913 530 850 804 172 9 8 4 8 543 823 1012 1273 1152 59 1 32 234 561 607 376 278 405 317 95 11 0 8 16 4 12
220 209 237 184 172 227 231 298 390 308 48 3 6 126 398 532 623 716 759 215 0 260 269 443 430 425 383 382 338 49 22 37 226
321 424 450 345 376 450 618 215 153 202 101 4 44 361 359 276 273 358 399 431 218 397 384 296 335 283 222 169 168 51 12 14 5 26 48 239
116 146 123 102 92 119 221 167 155 173 107 13 86 192 204 150 96 121 163 162 187 186 135 150 134 139 148 101 50 5 12 27 30 46 39 34
15 38 45 64 50 28 24 26 38 77 84 69 37 26

Figure 11. SATOB 701 - 1000 hPa vector mean wind. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

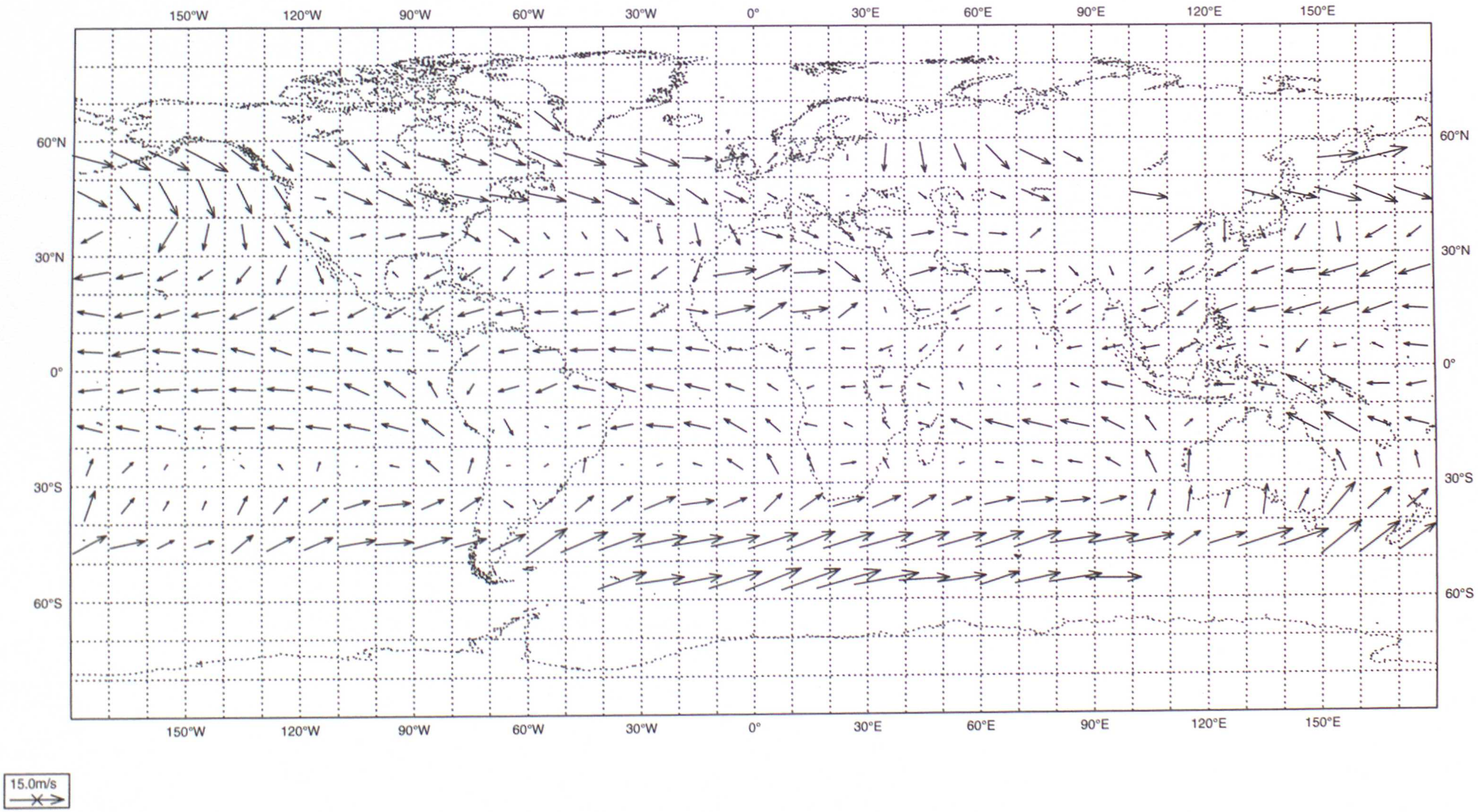

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

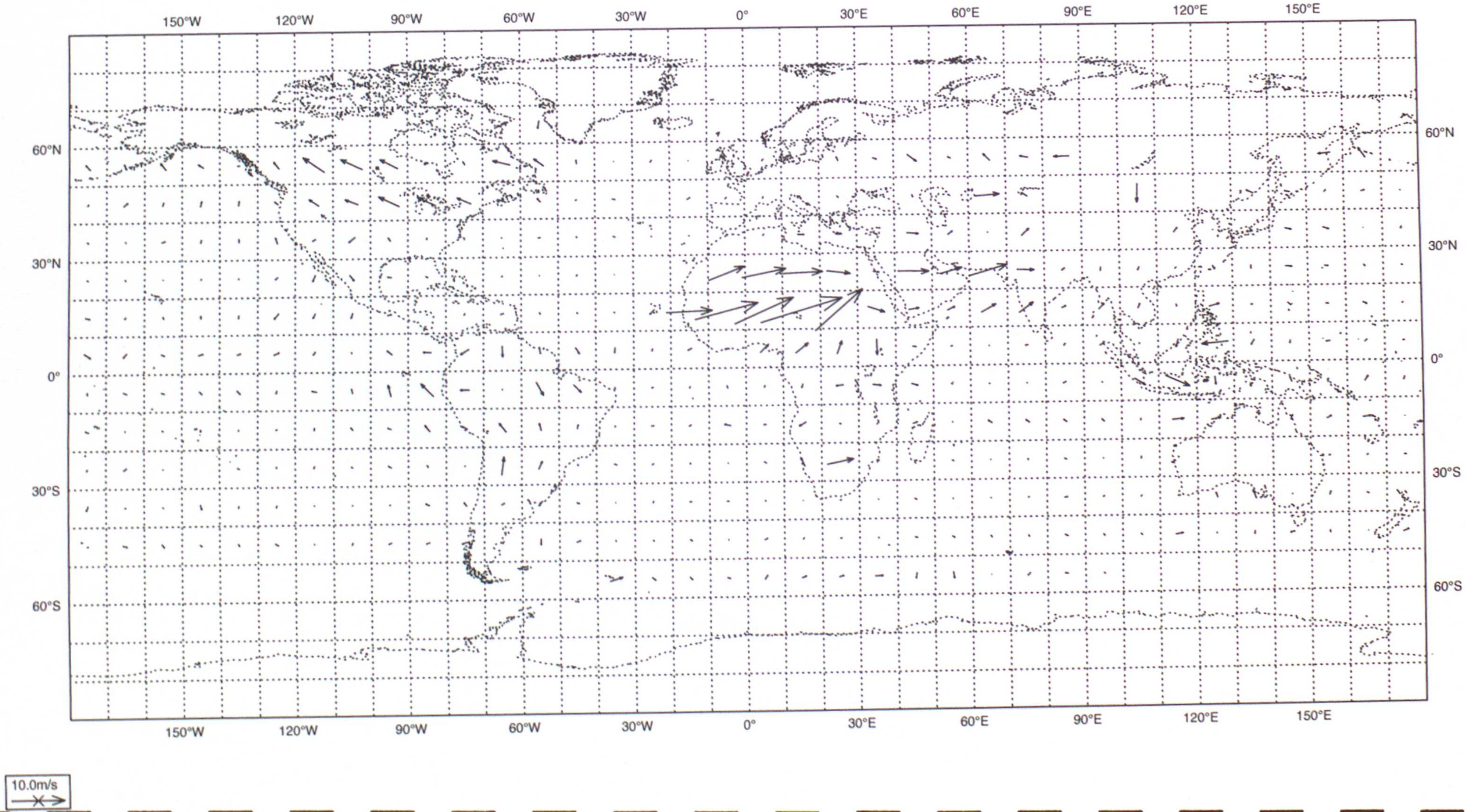

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

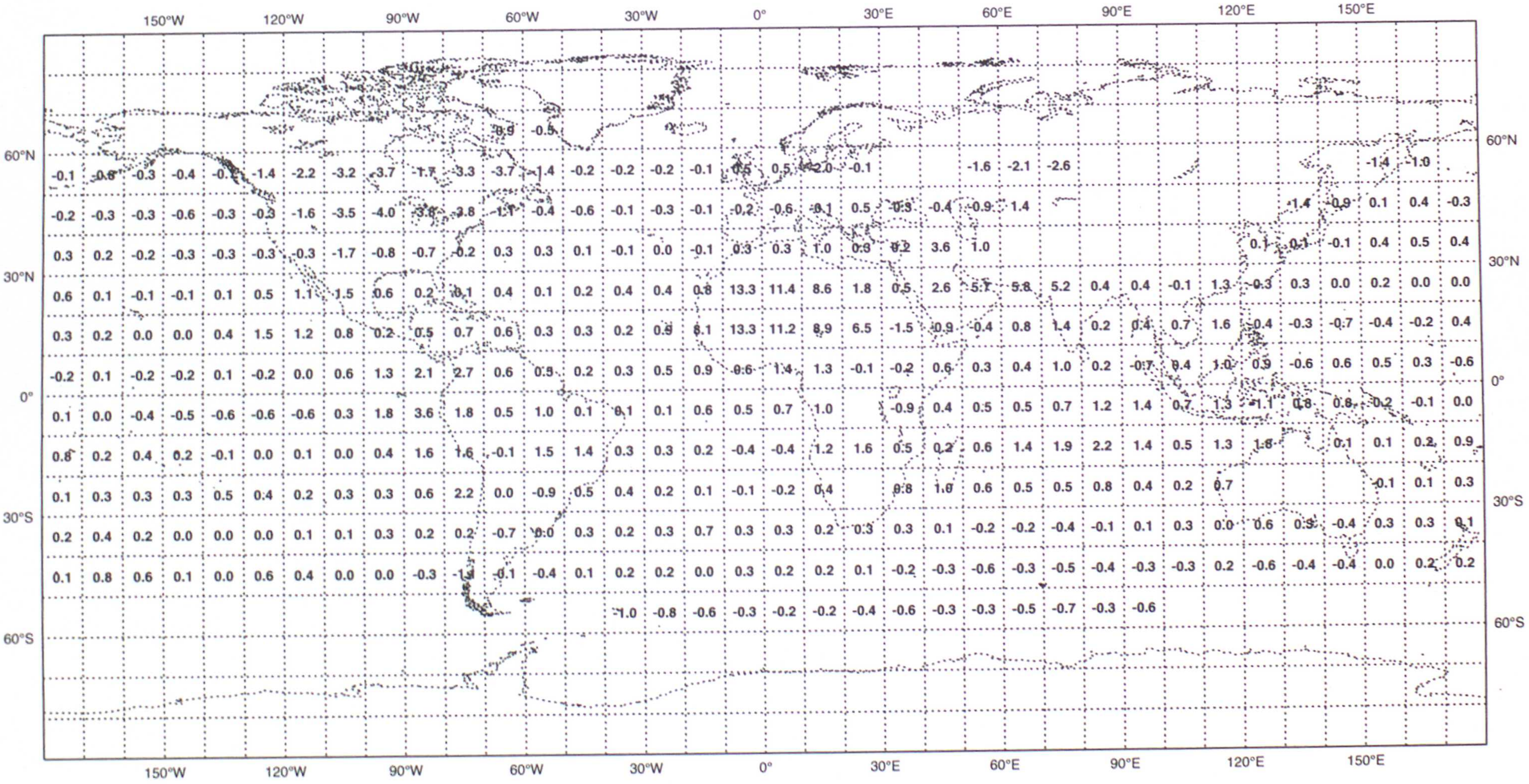

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.9 -0.5
-0.1 -0.6 -0.3 -0.4 -1.4 -2.2 -3.2 -3.7 -1.7 -3.3 -3.7 -1.4 -0.2 -0.2 -0.2 -0.1 0.5 0.5 -2.0 -0.1 -1.6 -2.1 -2.6 -1.4 -1.0
-0.2 -0.3 -0.3 -0.6 -0.3 -0.3 -1.6 -3.5 -4.0 -3.8 -3.8 -1.1 -0.4 -0.6 -0.1 -0.3 -0.1 -0.2 -0.6 -0.1 0.5 -0.3 -0.4 -0.9 1.4 -1.4 -0.9 0.1 0.4 -0.3
0.3 0.2 -0.2 -0.3 -0.3 -0.3 -0.3 -1.7 -0.8 -0.7 -0.2 0.3 0.3 0.1 -0.1 0.0 -0.1 0.3 0.3 1.0 0.8 0.2 3.6 1.0 0.1 0.1 -0.1 0.4 0.5 0.4
0.6 0.1 -0.1 -0.1 0.1 0.5 1.1 1.5 0.6 0.2 0.1 0.4 0.1 0.2 0.4 0.4 0.8 13.3 11.4 8.6 1.8 0.5 2.6 5.7 5.8 5.2 0.4 0.4 -0.1 1.3 -0.3 0.3 0.0 0.2 0.0 0.0
0.3 0.2 0.0 0.0 0.4 1.5 1.2 0.8 0.2 0.5 0.7 0.6 0.3 0.3 0.2 0.9 8.1 13.3 11.2 8.9 6.5 -1.5 -0.9 -0.4 0.8 1.4 0.2 0.4 0.7 1.6 -0.4 -0.3 -0.7 -0.4 -0.2 0.4
-0.2 0.1 -0.2 -0.2 0.1 -0.2 0.0 0.6 1.3 2.1 2.7 0.6 0.5 0.2 0.3 0.5 0.9 0.6 1.4 1.3 -0.1 -0.2 0.6 0.3 0.4 1.0 0.2 -0.7 0.4 1.0 0.9 -0.6 0.6 0.5 0.3 -0.6
0.1 0.0 -0.4 -0.5 -0.6 -0.6 -0.6 0.3 1.8 3.6 1.8 0.5 1.0 0.1 0.1 0.1 0.6 0.5 0.7 1.0 -0.9 0.4 0.5 0.5 0.7 1.2 1.4 0.7 1.3 -1.1 0.8 0.8 -0.2 -0.1 0.0
0.8 0.2 0.4 0.2 -0.1 0.0 0.1 0.0 0.4 1.6 1.6 -0.1 1.5 1.4 0.3 0.3 0.2 -0.4 -0.4 1.2 1.6 0.5 0.2 0.6 1.4 1.9 2.2 1.4 0.5 1.3 1.8 0.1 0.1 0.2 0.9
0.1 0.3 0.3 0.3 0.5 0.4 0.2 0.3 0.3 0.6 2.2 0.0 -0.9 0.5 0.4 0.2 0.1 -0.1 -0.2 0.4 0.8 1.0 0.6 0.5 0.5 0.8 0.4 0.2 0.7 -0.1 0.1 0.3
0.2 0.4 0.2 0.0 0.0 0.0 0.1 0.1 0.3 0.2 0.2 -0.7 0.0 0.3 0.2 0.3 0.7 0.3 0.3 0.2 0.3 0.3 0.1 -0.2 -0.2 -0.4 -0.1 0.1 0.3 0.0 0.6 0.3 -0.4 0.3 0.3 0.1
0.1 0.8 0.6 0.1 0.0 0.6 0.4 0.0 0.0 -0.3 -1.1 -0.1 -0.4 0.1 0.2 0.2 0.0 0.3 0.2 0.2 0.1 -0.2 -0.3 -0.6 -0.3 -0.5 -0.4 -0.3 -0.3 0.2 -0.6 -0.4 -0.4 0.0 0.2 0.2
-1.0 -0.8 -0.6 -0.3 -0.2 -0.2 -0.4 -0.6 -0.3 -0.3 -0.5 -0.7 -0.3 -0.6

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

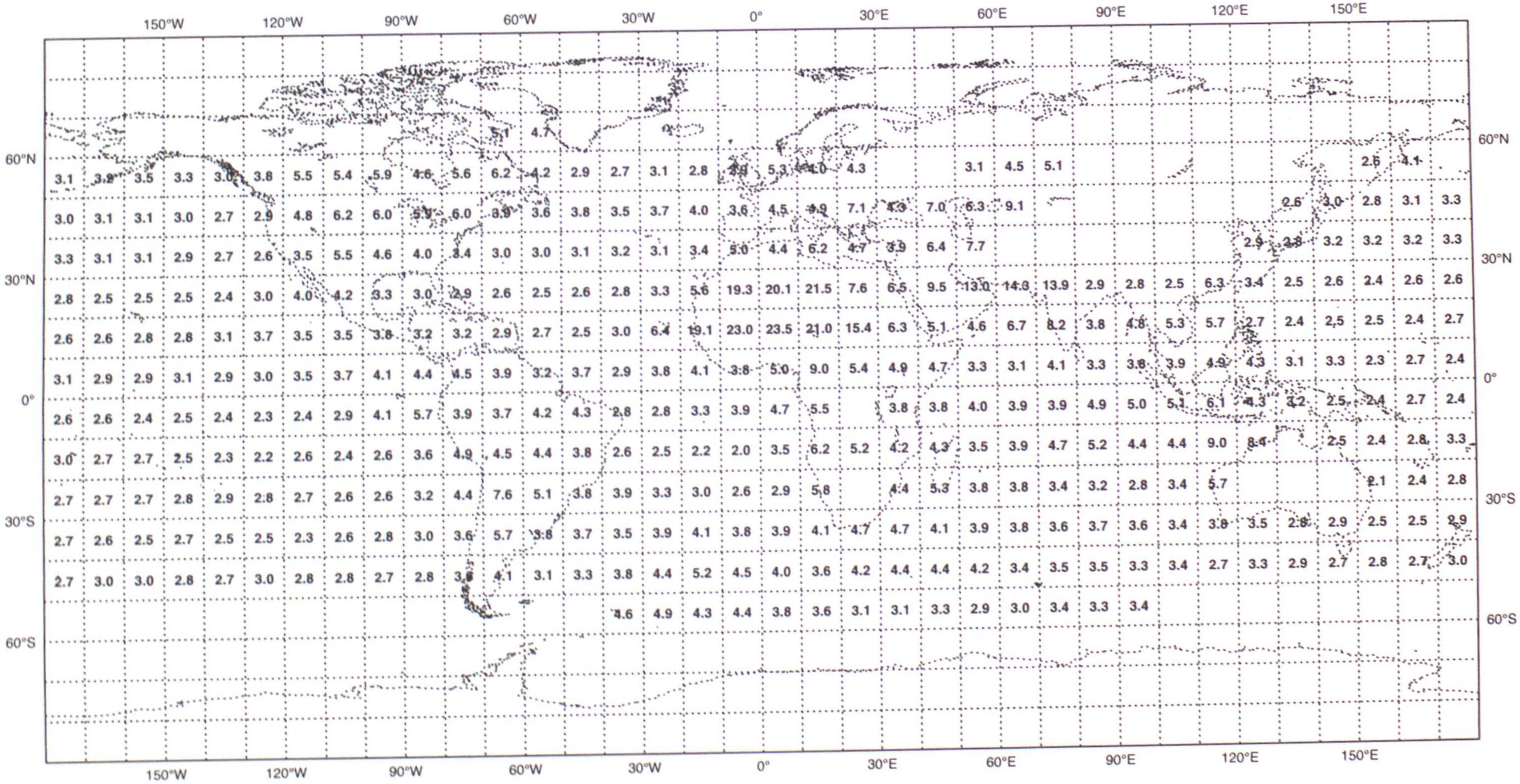

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5.1 4.7
3.1 3.9 3.5 3.3 3.0 3.8 5.5 5.4 5.9 4.6 5.6 6.2 4.2 2.9 2.7 3.1 2.8 3.9 5.3 4.0 4.3 3.1 4.5 5.1 2.6 4.1
3.0 3.1 3.1 3.0 2.7 2.9 4.8 6.2 6.0 5.9 6.0 3.9 3.6 3.8 3.5 3.7 4.0 3.6 4.5 4.9 7.1 4.3 7.0 6.3 9.1 2.6 3.0 2.8 3.1 3.3
3.3 3.1 3.1 2.9 2.7 2.6 3.5 5.5 4.6 4.0 3.4 3.0 3.0 3.1 3.2 3.1 3.4 5.0 4.4 6.2 4.7 3.9 6.4 7.7 2.9 2.8 3.2 3.2 3.2 3.3
2.8 2.5 2.5 2.5 2.4 3.0 4.0 4.2 3.3 3.0 2.9 2.6 2.5 2.6 2.8 3.3 5.6 19.3 20.1 21.5 7.6 6.5 9.5 13.0 14.8 13.9 2.9 2.8 2.5 6.3 3.4 2.5 2.6 2.4 2.6 2.6
2.6 2.6 2.8 2.8 3.1 3.7 3.5 3.5 3.8 3.2 3.2 2.9 2.7 2.5 3.0 6.4 19.1 23.0 23.5 21.0 15.4 6.3 5.1 4.6 6.7 8.2 3.8 4.8 5.3 5.7 2.7 2.4 2.5 2.5 2.4 2.7
3.1 2.9 2.9 3.1 2.9 3.0 3.5 3.7 4.1 4.4 4.5 3.9 3.2 3.7 2.9 3.8 4.1 3.8 5.0 9.0 5.4 4.9 4.7 3.3 3.1 4.1 3.3 3.8 3.9 4.9 4.3 3.1 3.3 2.3 2.7 2.4
2.6 2.6 2.4 2.5 2.4 2.3 2.4 2.9 4.1 5.7 3.9 3.7 4.2 4.3 2.8 2.8 3.3 3.9 4.7 5.5 3.8 3.8 4.0 3.9 3.9 4.9 5.0 5.1 6.1 4.3 3.2 2.5 2.4 2.7 2.4
3.0 2.7 2.7 2.5 2.3 2.2 2.6 2.4 2.6 3.6 4.9 4.5 4.4 3.8 2.6 2.5 2.2 2.0 3.5 6.2 5.2 4.2 4.3 3.5 3.9 4.7 5.2 4.4 4.4 9.0 8.4 2.5 2.4 2.8 3.3
2.7 2.7 2.7 2.8 2.9 2.8 2.7 2.6 2.6 3.2 4.4 7.6 5.1 3.8 3.9 3.3 3.0 2.6 2.9 5.8 4.4 5.3 3.8 3.8 3.4 3.2 2.8 3.4 5.7 2.1 2.4 2.8
2.7 2.6 2.5 2.7 2.5 2.5 2.3 2.6 2.8 3.0 3.6 5.7 3.8 3.7 3.5 3.9 4.1 3.8 3.9 4.1 4.7 4.7 4.1 3.9 3.8 3.6 3.7 3.6 3.4 3.8 3.5 2.8 2.9 2.5 2.5 2.9
2.7 3.0 3.0 2.8 2.7 3.0 2.8 2.8 2.7 2.8 3.6 4.1 3.1 3.3 3.8 4.4 5.2 4.5 4.0 3.6 4.2 4.4 4.4 4.2 3.4 3.5 3.5 3.3 3.4 2.7 3.3 2.9 2.7 2.8 2.7 3.0
4.6 4.9 4.3 4.4 3.8 3.6 3.1 3.1 3.3 2.9 3.0 3.4 3.3 3.4

Figure 15. SATOB 401 - 700 hPa mean daily count. NOVEMBER 2003
Global average number of observations in 24 hours = 16207

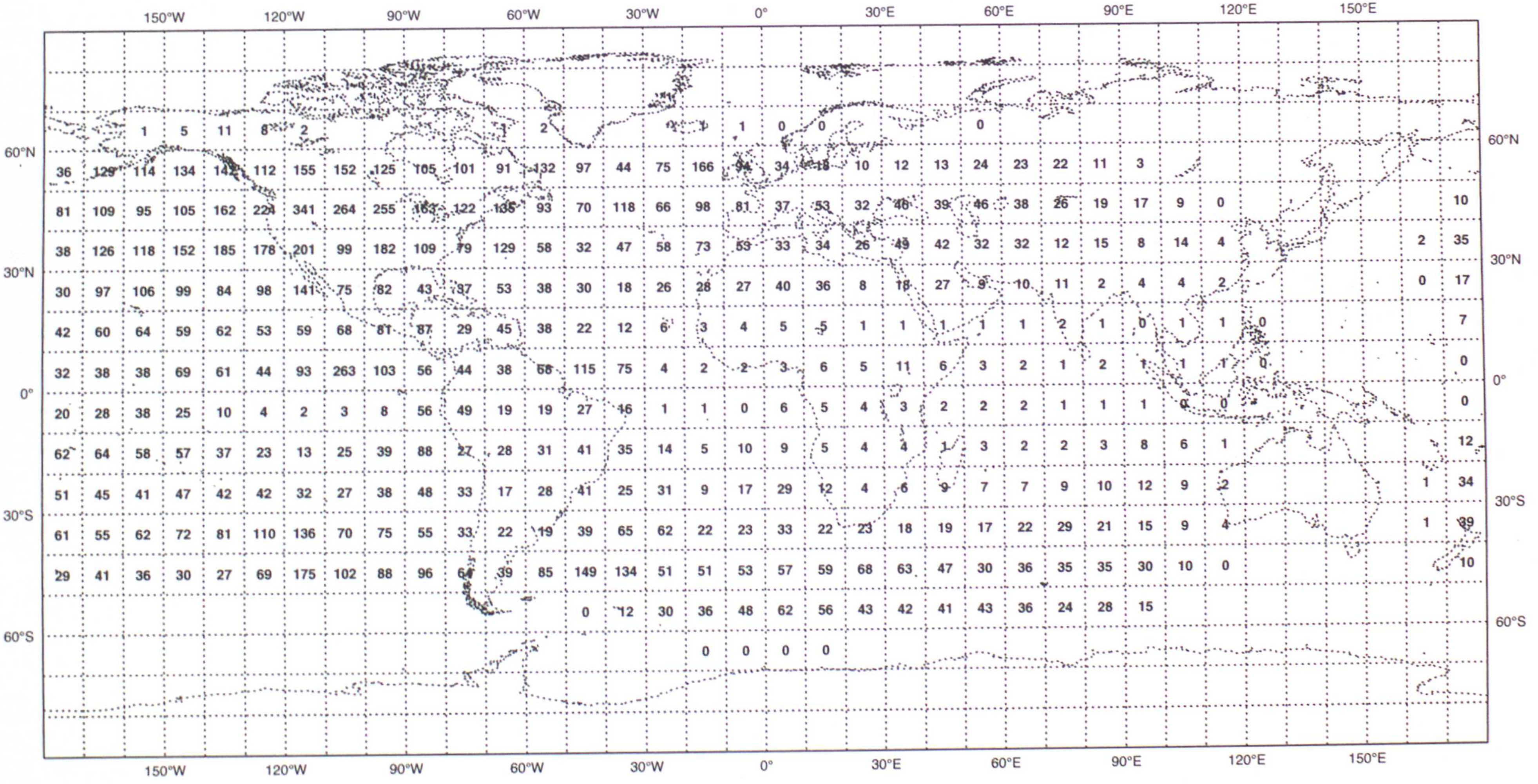

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 5 11 8 2 1 2 1 1 0 0 0
36 129 114 134 142 112 155 152 125 105 101 91 132 97 44 75 166 94 34 18 10 12 13 24 23 22 11 3
81 109 95 105 162 224 341 264 255 163 122 135 93 70 118 66 98 81 37 53 32 46 39 46 38 26 19 17 9 0 10
38 126 118 152 185 178 201 99 182 109 79 129 58 32 47 58 73 53 33 34 26 49 42 32 32 12 15 8 14 4 2 35
30 97 106 99 84 98 141 75 82 43 37 53 38 30 18 26 28 27 40 36 8 18 27 9 10 11 2 4 4 2 0 17
42 60 64 59 62 53 59 68 81 87 29 45 38 22 12 6 3 4 5 5 1 1 1 1 1 2 1 0 1 1 0 7
32 38 38 69 61 44 93 263 103 56 44 38 68 115 75 4 2 2 3 6 5 11 6 3 2 1 2 1 1 1 0 0
20 28 38 25 10 4 2 3 8 56 49 19 19 27 16 1 1 0 6 5 4 3 2 2 2 1 1 1 0 0 0
62 64 58 57 37 23 13 25 39 88 27 28 31 41 35 14 5 10 9 5 4 4 1 3 2 2 3 8 6 1 12
51 45 41 47 42 42 32 27 38 48 33 17 28 41 25 31 9 17 29 12 4 6 9 7 7 9 10 12 9 2 1 34
61 55 62 72 81 110 136 70 75 55 33 22 19 39 65 62 22 23 33 22 23 18 19 17 22 29 21 15 9 4 1 39
29 41 36 30 27 69 175 102 88 96 64 39 85 149 134 51 51 53 57 59 68 63 47 30 36 35 35 30 10 0 10
0 12 30 36 48 62 56 43 42 41 43 36 24 28 15
0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

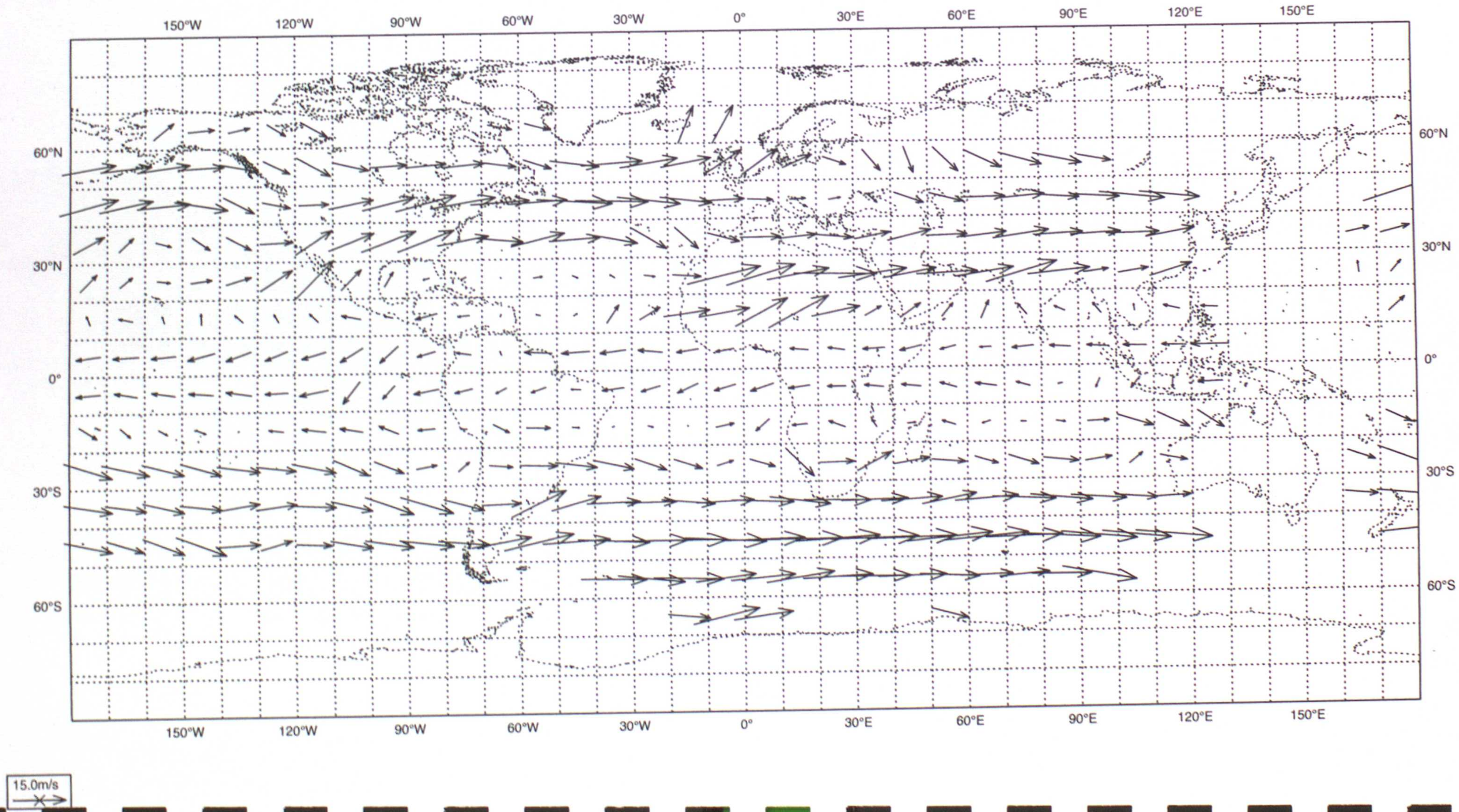
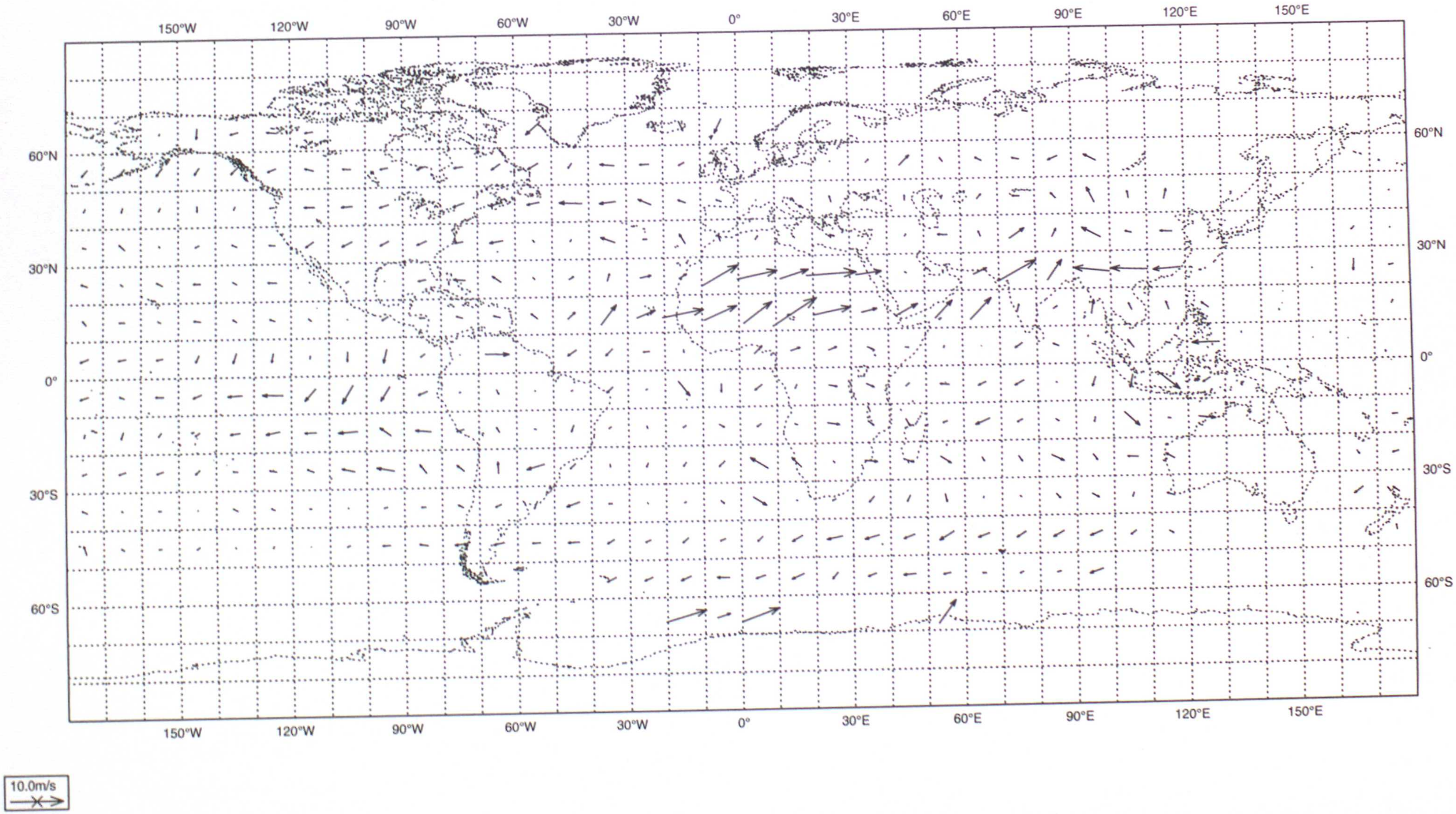

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present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120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

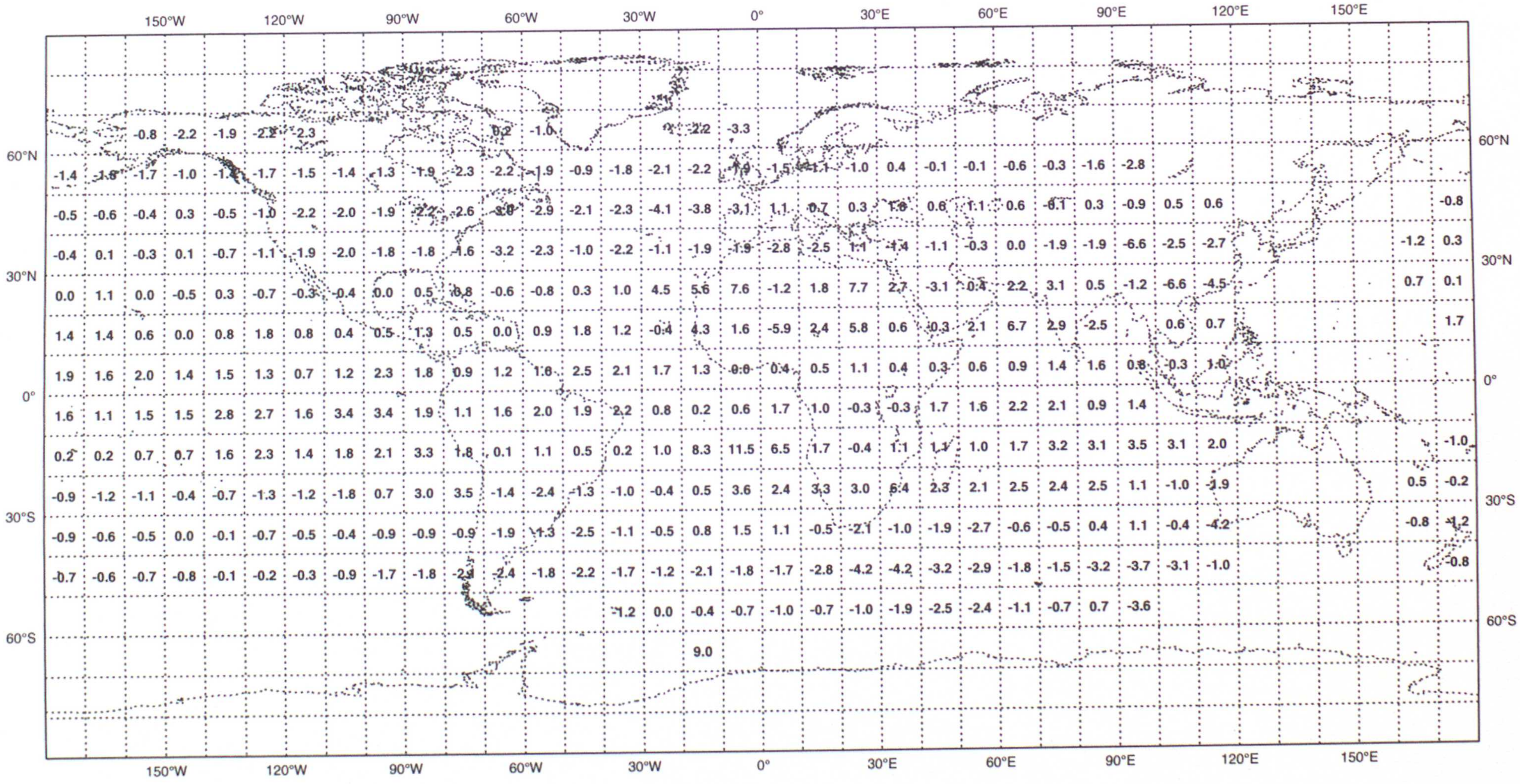
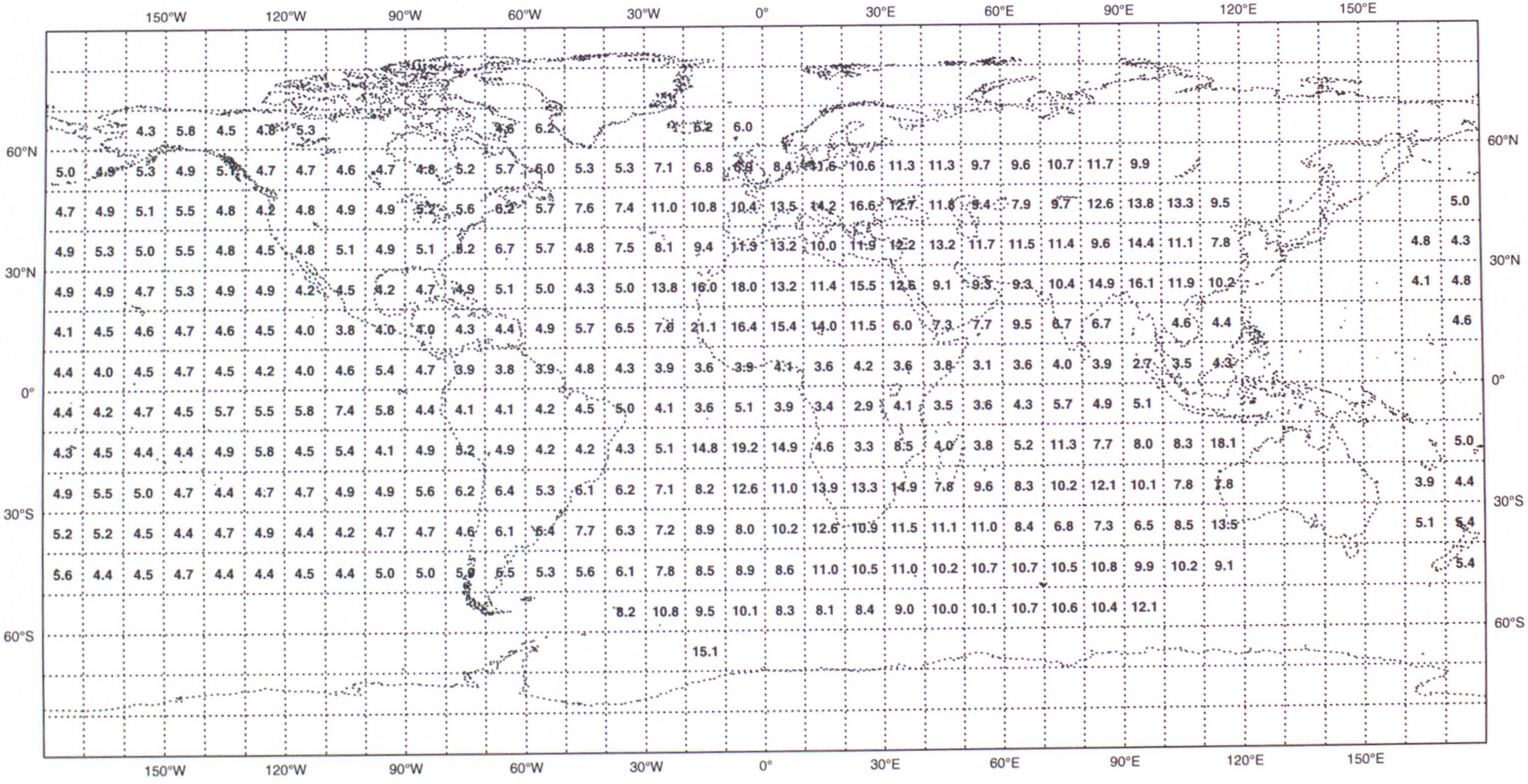

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-0.8 -2.2 -1.9 -2.2 -2.3 0.2 -1.0 2.2 -3.3
-1.4 -1.8 -1.7 -1.0 -1.4 -1.7 -1.5 -1.4 -1.3 -1.9 -2.3 -2.2 -1.9 -0.9 -1.8 -2.1 -2.2 -1.9 -1.5 -1.1 -1.0 0.4 -0.1 -0.1 -0.6 -0.3 -1.6 -2.8
-0.5 -0.6 -0.4 0.3 -0.5 -1.0 -2.2 -2.0 -1.9 -2.2 -2.6 -3.0 -2.9 -2.1 -2.3 -4.1 -3.8 -3.1 1.1 0.7 0.3 1.8 0.6 1.1 0.6 -0.1 0.3 -0.9 0.5 0.6 -0.8
-0.4 0.1 -0.3 0.1 -0.7 -1.1 -1.9 -2.0 -1.8 -1.8 -1.6 -3.2 -2.3 -1.0 -2.2 -1.1 -1.9 -1.9 -2.8 -2.5 1.1 -1.4 -1.1 -0.3 0.0 -1.9 -1.9 -6.6 -2.5 -2.7 -1.2 0.3
0.0 1.1 0.0 -0.5 0.3 -0.7 -0.3 -0.4 0.0 0.5 0.8 -0.6 -0.8 0.3 1.0 4.5 5.6 7.6 -1.2 1.8 7.7 2.7 -3.1 0.4 2.2 3.1 0.5 -1.2 -6.6 -4.5 0.7 0.1
1.4 1.4 0.6 0.0 0.8 1.8 0.8 0.4 0.5 1.3 0.5 0.0 0.9 1.8 1.2 -0.4 4.3 1.6 -5.9 2.4 5.8 0.6 0.3 2.1 6.7 2.9 -2.5 0.6 0.7 1.7
1.9 1.6 2.0 1.4 1.5 1.3 0.7 1.2 2.3 1.8 0.9 1.2 1.6 2.5 2.1 1.7 1.3 0.0 0.4 0.5 1.1 0.4 0.3 0.6 0.9 1.4 1.6 0.8 -0.3 1.0
1.6 1.1 1.5 1.5 2.8 2.7 1.6 3.4 3.4 1.9 1.1 1.6 2.0 1.9 2.2 0.8 0.2 0.6 1.7 1.0 -0.3 -0.3 1.7 1.6 2.2 2.1 0.9 1.4
0.2 0.2 0.7 0.7 1.6 2.3 1.4 1.8 2.1 3.3 1.8 0.1 1.1 0.5 0.2 1.0 8.3 11.5 6.5 1.7 -0.4 1.1 1.1 1.0 1.7 3.2 3.1 3.5 3.1 2.0 -1.0
-0.9 -1.2 -1.1 -0.4 -0.7 -1.3 -1.2 -1.8 0.7 3.0 3.5 -1.4 -2.4 -1.3 -1.0 -0.4 0.5 3.6 2.4 3.3 3.0 6.4 2.3 2.1 2.5 2.4 2.5 1.1 -1.0 -3.9 0.5 -0.2
-0.9 -0.6 -0.5 0.0 -0.1 -0.7 -0.5 -0.4 -0.9 -0.9 -0.9 -1.9 -1.3 -2.5 -1.1 -0.5 0.8 1.5 1.1 -0.5 -2.1 -1.0 -1.9 -2.7 -0.6 -0.5 0.4 1.1 -0.4 -4.2 -0.8 -1.2
-0.7 -0.6 -0.7 -0.8 -0.1 -0.2 -0.3 -0.9 -1.7 -1.8 -2.4 -2.4 -1.8 -2.2 -1.7 -1.2 -2.1 -1.8 -1.7 -2.8 -4.2 -4.2 -3.2 -2.9 -1.8 -1.5 -3.2 -3.7 -3.1 -1.0 -0.8
-1.2 0.0 -0.4 -0.7 -1.0 -0.7 -1.0 -1.9 -2.5 -2.4 -1.1 -0.7 0.7 -3.6
9.0

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
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0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.3 5.8 4.5 4.8 5.3 4.6 6.2 6.2 6.0
5.0 4.9 5.3 4.9 5.1 4.7 4.7 4.6 4.7 4.8 5.2 5.7 6.0 5.3 5.3 7.1 6.8 6.9 8.4 11.6 10.6 11.3 11.3 9.7 9.6 10.7 11.7 9.9
4.7 4.9 5.1 5.5 4.8 4.2 4.8 4.9 4.9 5.2 5.6 6.2 5.7 7.6 7.4 11.0 10.8 10.4 13.5 14.2 16.6 12.7 11.8 9.4 7.9 9.7 12.6 13.8 13.3 9.5 5.0
4.9 5.3 5.0 5.5 4.8 4.5 4.8 5.1 4.9 5.1 8.2 6.7 5.7 4.8 7.5 8.1 9.4 11.9 13.2 10.0 11.9 12.2 13.2 11.7 11.5 11.4 9.6 14.4 11.1 7.8 4.8 4.3
4.9 4.9 4.7 5.3 4.9 4.9 4.2 4.5 4.2 4.7 4.9 5.1 5.0 4.3 5.0 13.8 16.0 18.0 13.2 11.4 15.5 12.6 9.1 9.3 9.3 10.4 14.9 16.1 11.9 10.2 4.1 4.8
4.1 4.5 4.6 4.7 4.6 4.5 4.0 3.8 4.0 4.0 4.3 4.4 4.9 5.7 6.5 7.0 21.1 16.4 15.4 14.0 11.5 6.0 7.3 7.7 9.5 6.7 6.7 4.6 4.4 4.6
4.4 4.0 4.5 4.7 4.5 4.2 4.0 4.6 5.4 4.7 3.9 3.8 3.9 4.8 4.3 3.9 3.6 3.9 4.1 3.6 4.2 3.6 3.8 3.1 3.6 4.0 3.9 2.7 3.5 4.3
4.4 4.2 4.7 4.5 5.7 5.5 5.8 7.4 5.8 4.4 4.1 4.1 4.2 4.5 5.0 4.1 3.6 5.1 3.9 3.4 2.9 4.1 3.5 3.6 4.3 5.7 4.9 5.1
4.3 4.5 4.4 4.4 4.9 5.8 4.5 5.4 4.1 4.9 5.2 4.9 4.2 4.2 4.3 5.1 14.8 19.2 14.9 4.6 3.3 8.5 4.0 3.8 5.2 11.3 7.7 8.0 8.3 18.1 5.0
4.9 5.5 5.0 4.7 4.4 4.7 4.7 4.9 4.9 5.6 6.2 6.4 5.3 6.1 6.2 7.1 8.2 12.6 11.0 13.9 13.3 14.9 7.8 9.6 8.3 10.2 12.1 10.1 7.8 7.8 3.9 4.4
5.2 5.2 4.5 4.4 4.7 4.9 4.4 4.2 4.7 4.7 4.6 6.1 5.4 7.7 6.3 7.2 8.9 8.0 10.2 12.6 10.9 11.5 11.1 11.0 8.4 6.8 7.3 6.5 8.5 13.5 5.1 5.4
5.6 4.4 4.5 4.7 4.4 4.4 4.5 4.4 5.0 5.0 5.0 5.5 5.3 5.6 6.1 7.8 8.5 8.9 8.6 11.0 10.5 11.0 10.2 10.7 10.7 10.5 10.8 9.9 10.2 9.1 5.4
8.2 10.8 9.5 10.1 8.3 8.1 8.4 9.0 10.0 10.1 10.7 10.6 10.4 12.1
15.1

Figure 20. SATOB 101 - 400 hPa mean daily count. NOVEMBER 2003
Global average number of observations in 24 hours = 235076

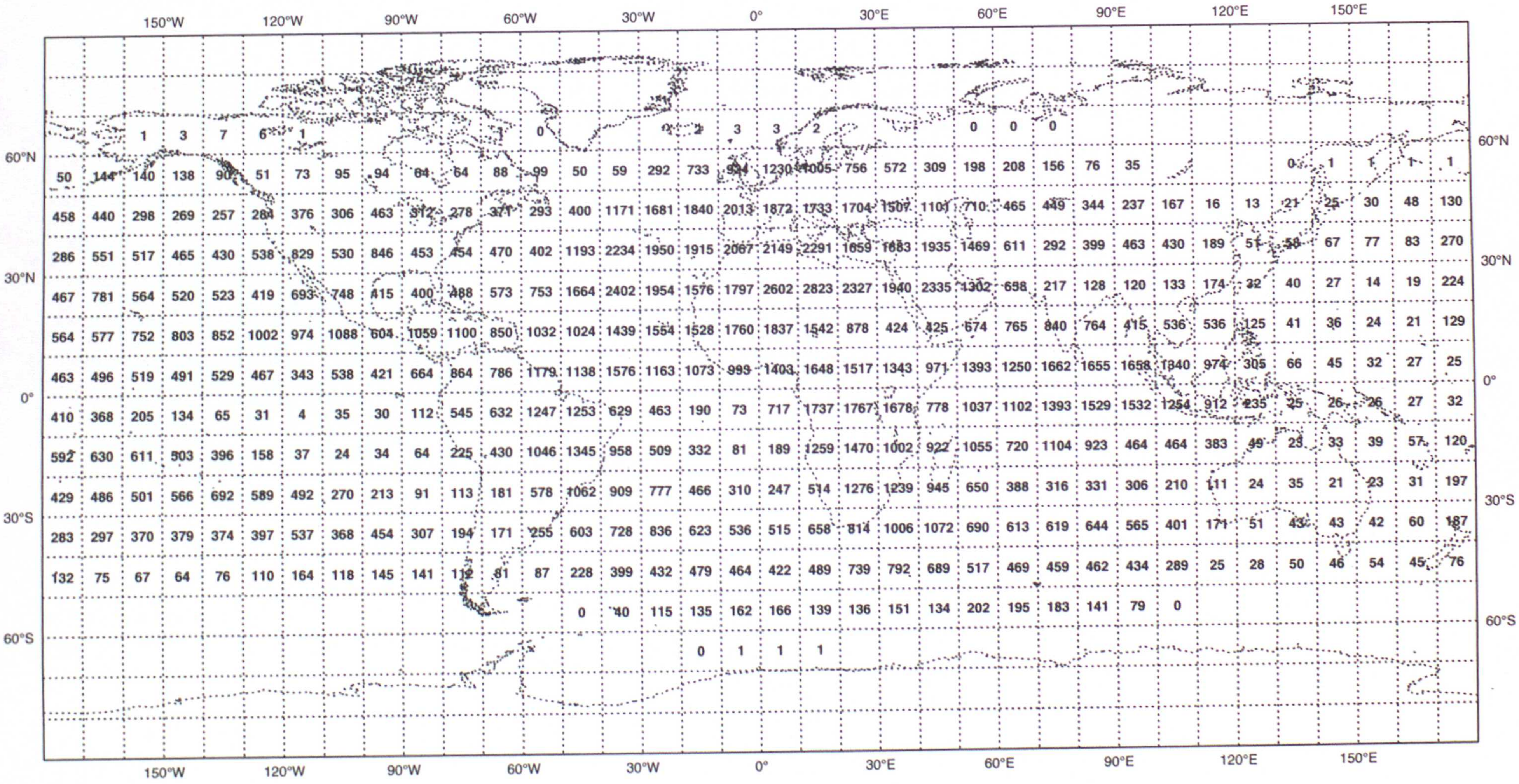

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 3 7 6 1 1 0 2 3 3 2 0 0 0
50 144 140 138 90 51 73 95 94 64 64 88 99 50 59 292 733 934 1230 1005 756 572 309 198 208 156 76 35 0 1 1 1 1
458 440 298 269 257 284 376 306 463 312 278 371 293 400 1171 1681 1840 2013 1872 1733 1704 1507 1101 710 465 449 344 237 167 16 13 21 25 30 48 130
286 551 517 465 430 538 829 530 846 453 454 470 402 1193 2234 1950 1915 2067 2149 2291 1659 1683 1935 1469 611 292 399 463 430 189 51 58 67 77 83 270
467 781 564 520 523 419 693 748 415 400 488 573 753 1664 2402 1954 1576 1797 2602 2823 2327 1940 2335 1302 658 217 128 120 133 174 32 40 27 14 19 224
564 577 752 803 852 1002 974 1088 604 1059 1100 850 1032 1024 1439 1554 1528 1760 1837 1542 878 424 425 674 765 840 764 415 536 536 125 41 36 24 21 129
463 496 519 491 529 467 343 538 421 664 864 786 1179 1138 1576 1163 1073 999 1403 1648 1517 1343 971 1393 1250 1662 1655 1658 1840 974 305 66 45 32 27 25
410 368 205 134 65 31 4 35 30 112 545 632 1247 1253 629 463 190 73 717 1737 1767 1678 778 1037 1102 1393 1529 1532 1254 912 235 25 26 26 27 32
592 630 611 503 396 158 37 24 34 64 225 430 1046 1345 958 509 332 81 189 1259 1470 1002 922 1055 720 1104 923 464 464 383 49 23 33 39 57 120
429 486 501 566 692 589 492 270 213 91 113 181 578 1062 909 777 466 310 247 514 1276 1239 945 650 388 316 331 306 210 111 24 35 21 23 31 197
283 297 370 379 374 397 537 368 454 307 194 171 255 603 728 836 623 536 515 658 814 1006 1072 690 613 619 644 565 401 171 51 43 43 42 60 187
132 75 67 64 76 110 164 118 145 141 112 81 87 228 399 432 479 464 422 489 739 792 689 517 469 459 462 434 289 25 28 50 46 54 45 76
0 40 115 135 162 166 139 136 151 134 202 195 183 141 79 0
0 1 1 1

Figure 21. SATOB 101 - 400 hPa vector mean wind. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

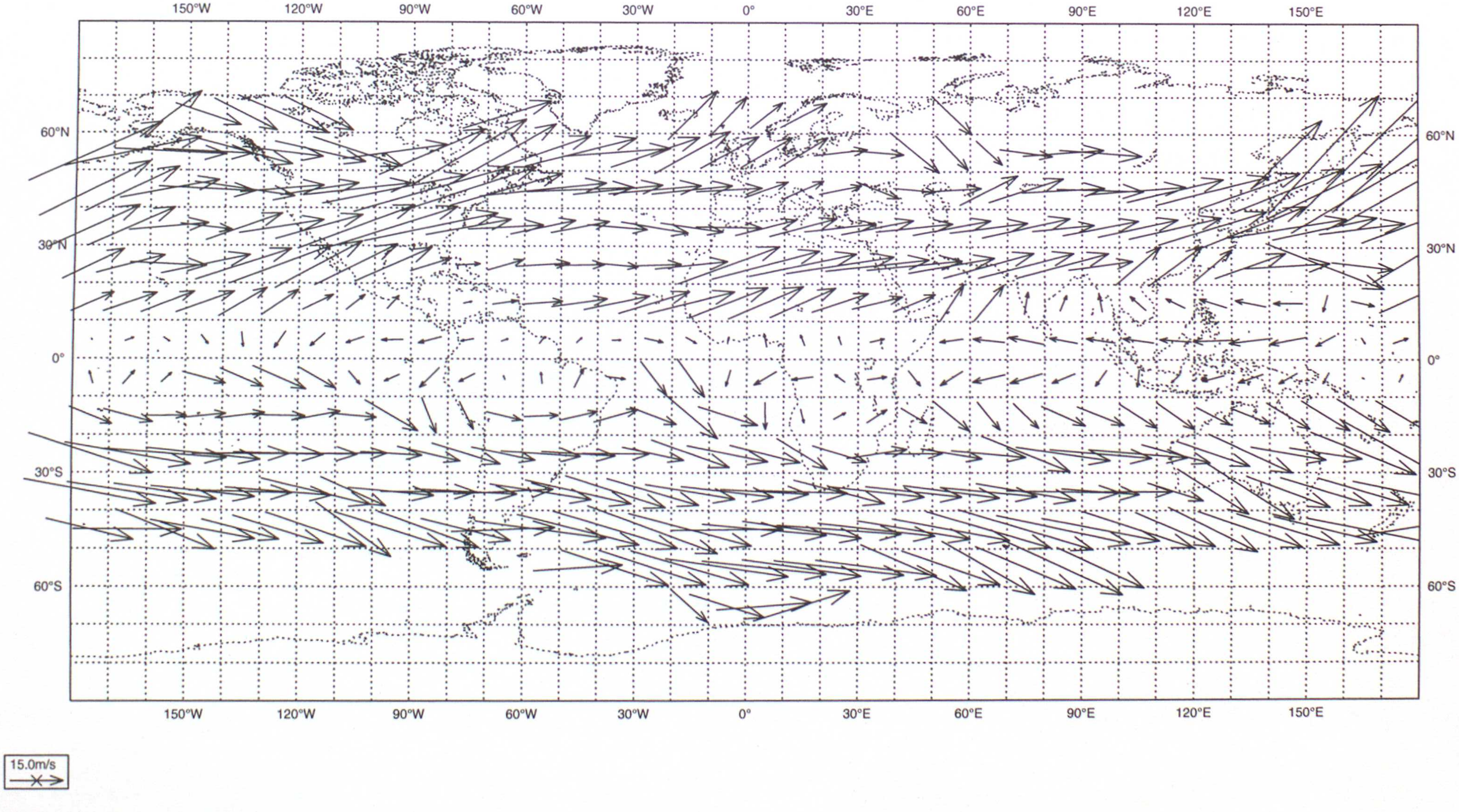

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. NOVEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

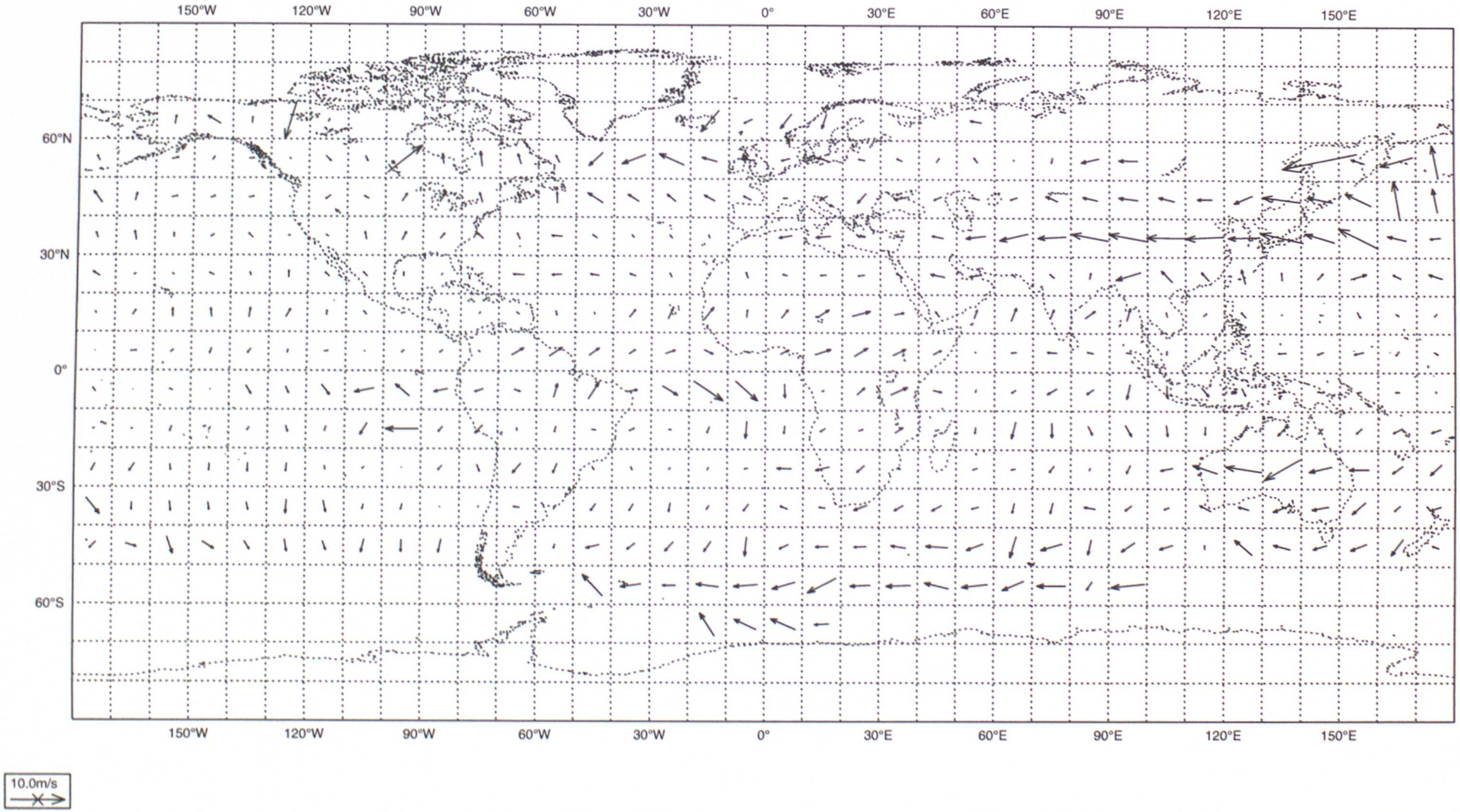

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

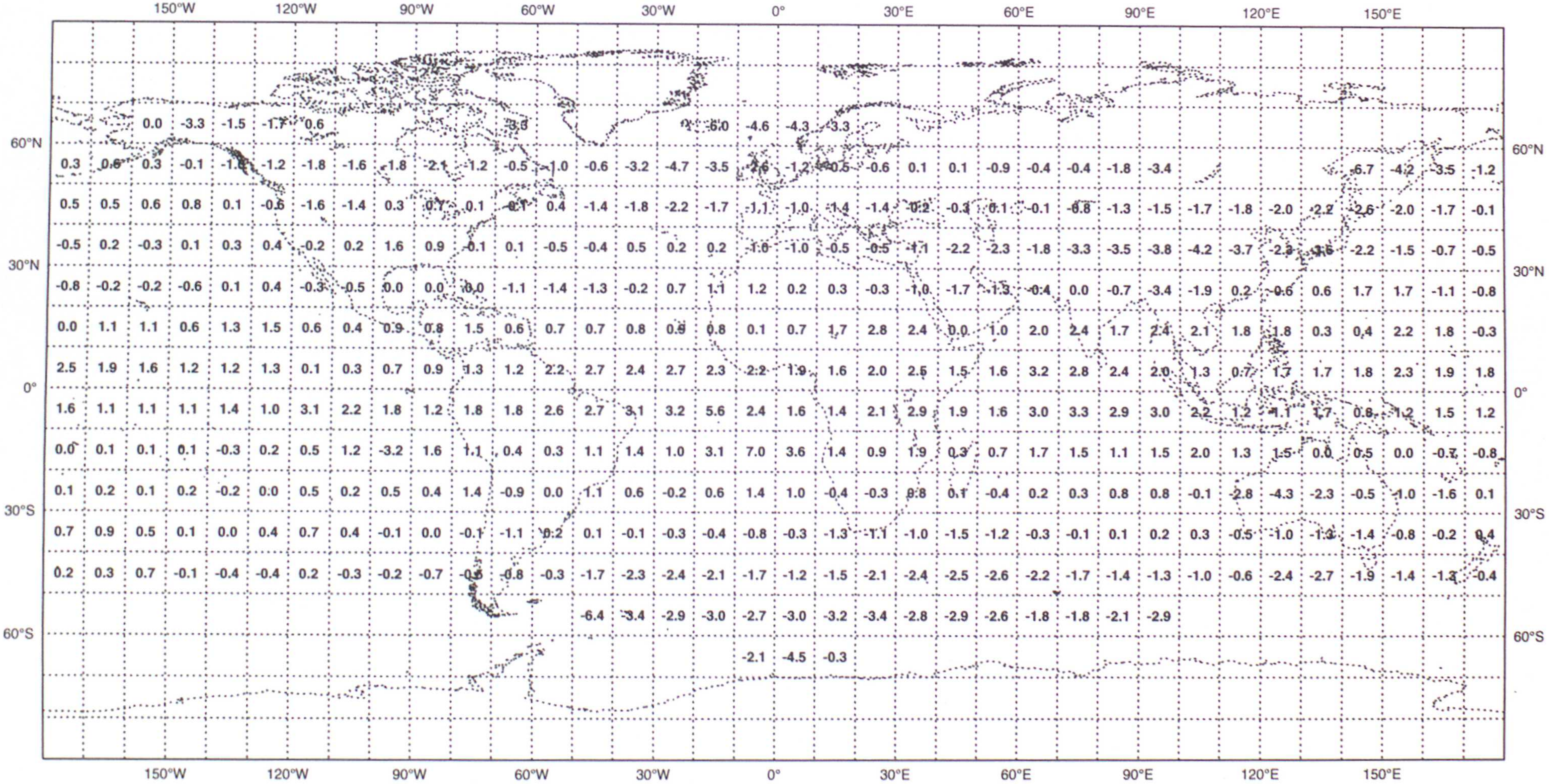
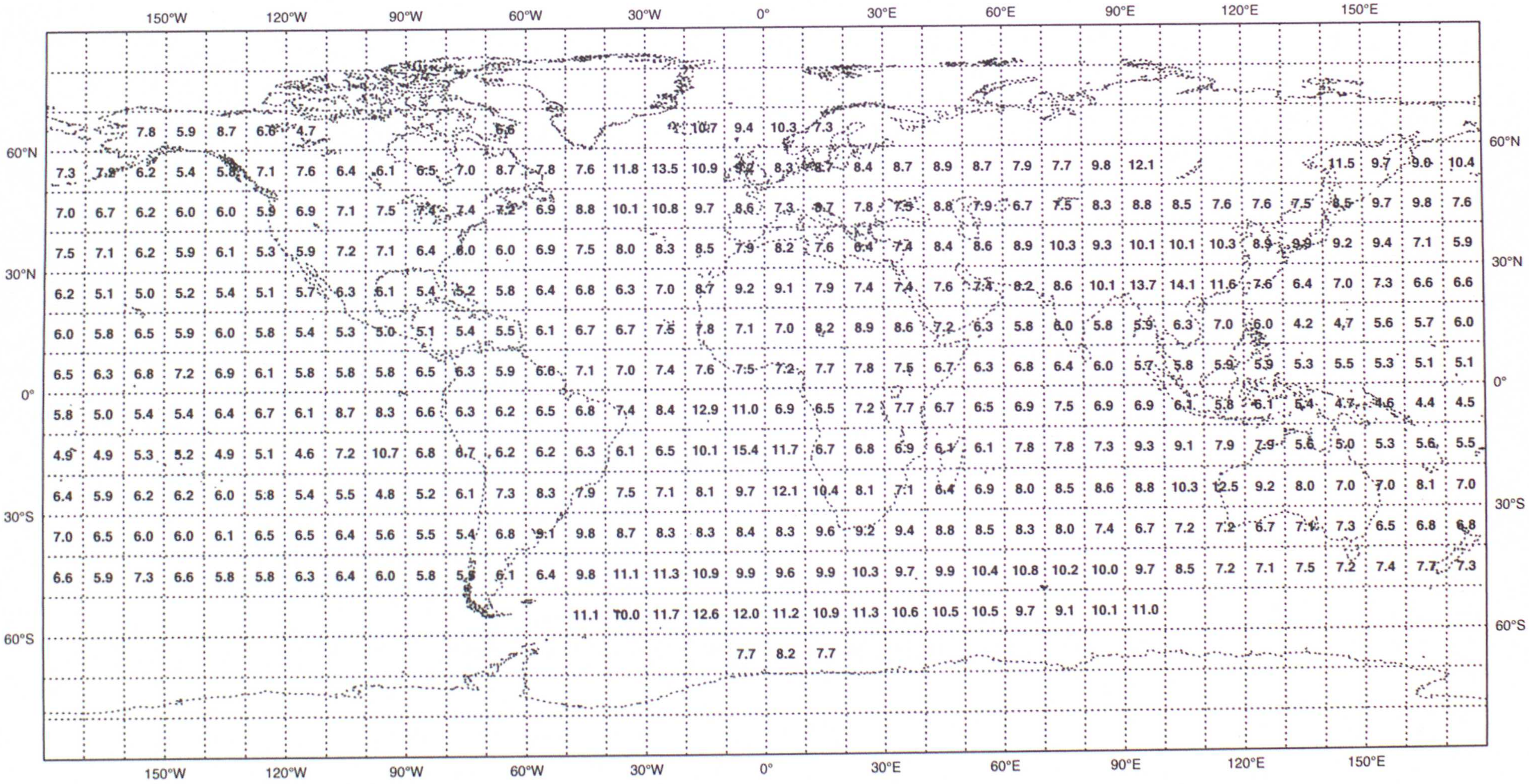

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.0 -3.3 -1.5 -1.7 0.6 -3.3 -6.0 -4.6 -4.3 -3.3
0.3 0.6 0.3 -0.1 -1.8 -1.2 -1.8 -1.6 -1.8 -2.1 -1.2 -0.5 -1.0 -0.6 -3.2 -4.7 -3.5 -2.6 -1.2 -0.5 -0.6 0.1 0.1 -0.9 -0.4 -0.4 -1.8 -3.4 -6.7 -4.2 -3.5 -1.2
0.5 0.5 0.6 0.8 0.1 -0.6 -1.6 -1.4 0.3 0.7 0.1 -0.1 0.4 -1.4 -1.8 -2.2 -1.7 -1.1 -1.0 -1.4 -1.4 -0.2 -0.3 0.1 -0.1 -0.8 -1.3 -1.5 -1.7 -1.8 -2.0 -2.2 -2.6 -2.0 -1.7 -0.1
-0.5 0.2 -0.3 0.1 0.3 0.4 -0.2 0.2 1.6 0.9 -0.1 0.1 -0.5 -0.4 0.5 0.2 0.2 -1.6 -1.0 -0.5 -0.5 -1.1 -2.2 -2.3 -1.8 -3.3 -3.5 -3.8 -4.2 -3.7 -2.3 -3.6 -2.2 -1.5 -0.7 -0.5
-0.8 -0.2 -0.2 -0.6 0.1 0.4 -0.3 -0.5 0.0 0.0 0.0 -1.1 -1.4 -1.3 -0.2 0.7 1.1 1.2 0.2 0.3 -0.3 -1.0 -1.7 -1.3 -0.4 0.0 -0.7 -3.4 -1.9 0.2 -0.6 0.6 1.7 1.7 -1.1 -0.8
0.0 1.1 1.1 0.6 1.3 1.5 0.6 0.4 0.9 0.8 1.5 0.6 0.7 0.7 0.8 0.9 0.8 0.1 0.7 1.7 2.8 2.4 0.0 1.0 2.0 2.4 1.7 2.4 2.1 1.8 1.8 0.3 0.4 2.2 1.8 -0.3
2.5 1.9 1.6 1.2 1.2 1.3 0.1 0.3 0.7 0.9 1.3 1.2 2.2 2.7 2.4 2.7 2.3 2.2 1.9 1.6 2.0 2.5 1.5 1.6 3.2 2.8 2.4 2.0 1.3 0.7 1.7 1.7 1.8 2.3 1.9 1.8
1.6 1.1 1.1 1.1 1.4 1.0 3.1 2.2 1.8 1.2 1.8 1.8 2.6 2.7 3.1 3.2 5.6 2.4 1.6 1.4 2.1 2.9 1.9 1.6 3.0 3.3 2.9 3.0 2.2 1.2 -1.1 1.7 0.8 -1.2 1.5 1.2
0.0 0.1 0.1 0.1 -0.3 0.2 0.5 1.2 -3.2 1.6 1.1 0.4 0.3 1.1 1.4 1.0 3.1 7.0 3.6 1.4 0.9 1.9 0.3 0.7 1.7 1.5 1.1 1.5 2.0 1.3 1.5 0.0 0.5 0.0 -0.7 -0.8
0.1 0.2 0.1 0.2 -0.2 0.0 0.5 0.2 0.5 0.4 1.4 -0.9 0.0 1.1 0.6 -0.2 0.6 1.4 1.0 -0.4 -0.3 0.8 0.1 -0.4 0.2 0.3 0.8 0.8 -0.1 -2.8 -4.3 -2.3 -0.5 -1.0 -1.6 0.1
0.7 0.9 0.5 0.1 0.0 0.4 0.7 0.4 -0.1 0.0 -0.1 -1.1 0.2 0.1 -0.1 -0.3 -0.4 -0.8 -0.3 -1.3 -1.1 -1.0 -1.5 -1.2 -0.3 -0.1 0.1 0.2 0.3 -0.5 -1.0 -1.3 -1.4 -0.8 -0.2 0.4
0.2 0.3 0.7 -0.1 -0.4 -0.4 0.2 -0.3 -0.2 -0.7 -0.5 -0.8 -0.3 -1.7 -2.3 -2.4 -2.1 -1.7 -1.2 -1.5 -2.1 -2.4 -2.5 -2.6 -2.2 -1.7 -1.4 -1.3 -1.0 -0.6 -2.4 -2.7 -1.9 -1.4 -1.3 -0.4
-6.4 -3.4 -2.9 -3.0 -2.7 -3.0 -3.2 -3.4 -2.8 -2.9 -2.6 -1.8 -1.8 -2.1 -2.9
-2.1 -4.5 -0.3

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
7.8 5.9 8.7 6.8 4.7 5.6 10.7 9.4 10.3 7.3
7.3 7.9 6.2 5.4 5.8 7.1 7.6 6.4 6.1 6.5 7.0 8.7 7.8 7.6 11.8 13.5 10.9 9.2 8.3 8.7 8.4 8.7 8.9 8.7 7.9 7.7 9.8 12.1 11.5 9.7 9.6 10.4
7.0 6.7 6.2 6.0 6.0 5.9 6.9 7.1 7.5 7.4 7.4 7.2 6.9 8.8 10.1 10.8 9.7 8.6 7.3 8.7 7.8 7.5 8.8 7.9 6.7 7.5 8.3 8.8 8.5 7.6 7.6 7.5 8.5 9.7 9.8 7.6
7.5 7.1 6.2 5.9 6.1 5.3 5.9 7.2 7.1 6.4 8.0 6.0 6.9 7.5 8.0 8.3 8.5 7.9 8.2 7.6 6.4 7.4 8.4 8.6 8.9 10.3 9.3 10.1 10.1 10.3 8.9 9.9 9.2 9.4 7.1 5.9
6.2 5.1 5.0 5.2 5.4 5.1 5.7 6.3 6.1 5.4 5.2 5.8 6.4 6.8 6.3 7.0 8.7 9.2 9.1 7.9 7.4 7.4 7.6 7.4 8.2 8.6 10.1 13.7 14.1 11.6 7.6 6.4 7.0 7.3 6.6 6.6
6.0 5.8 6.5 5.9 6.0 5.8 5.4 5.3 5.0 5.1 5.4 5.5 6.1 6.7 6.7 7.5 7.8 7.1 7.0 8.2 8.9 8.6 7.2 6.3 5.8 6.0 5.8 5.9 6.3 7.0 6.0 4.2 4.7 5.6 5.7 6.0
6.5 6.3 6.8 7.2 6.9 6.1 5.8 5.8 5.8 6.5 6.3 5.9 6.6 7.1 7.0 7.4 7.6 7.5 7.2 7.7 7.8 7.5 6.7 6.3 6.8 6.4 6.0 5.7 5.8 5.9 5.9 5.3 5.5 5.3 5.1 5.1
5.8 5.0 5.4 5.4 6.4 6.7 6.1 8.7 8.3 6.6 6.3 6.2 6.5 6.8 7.4 8.4 12.9 11.0 6.9 6.5 7.2 7.7 6.7 6.5 6.9 7.5 6.9 6.9 6.1 5.8 6.1 5.4 4.7 4.6 4.4 4.5
4.9 4.9 5.3 5.2 4.9 5.1 4.6 7.2 10.7 6.8 6.7 6.2 6.2 6.3 6.1 6.5 10.1 15.4 11.7 6.7 6.8 6.9 6.1 6.1 7.8 7.8 7.3 9.3 9.1 7.9 7.9 5.6 5.0 5.3 5.6 5.5
6.4 5.9 6.2 6.2 6.0 5.8 5.4 5.5 4.8 5.2 6.1 7.3 8.3 7.9 7.5 7.1 8.1 9.7 12.1 10.4 8.1 7.1 6.4 6.9 8.0 8.5 8.6 8.8 10.3 12.5 9.2 8.0 7.0 7.0 8.1 7.0
7.0 6.5 6.0 6.0 6.1 6.5 6.5 6.4 5.6 5.5 5.4 6.8 9.1 9.8 8.7 8.3 8.3 8.4 8.3 9.6 9.2 9.4 8.8 8.5 8.3 8.0 7.4 6.7 7.2 7.2 6.7 7.1 7.3 6.5 6.8 6.8
6.6 5.9 7.3 6.6 5.8 5.8 6.3 6.4 6.0 5.8 5.8 6.1 6.4 9.8 11.1 11.3 10.9 9.9 9.6 9.9 10.3 9.7 9.9 10.4 10.8 10.2 10.0 9.7 8.5 7.2 7.1 7.5 7.2 7.4 7.7 7.3
11.1 10.0 11.7 12.6 12.0 11.2 10.9 11.3 10.6 10.5 10.5 9.7 9.1 10.1 11.0
7.7 8.2 7.7

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: EXETER

MONTH: Nov 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15, NOAA-16 and NOAA-17.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). NOVEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

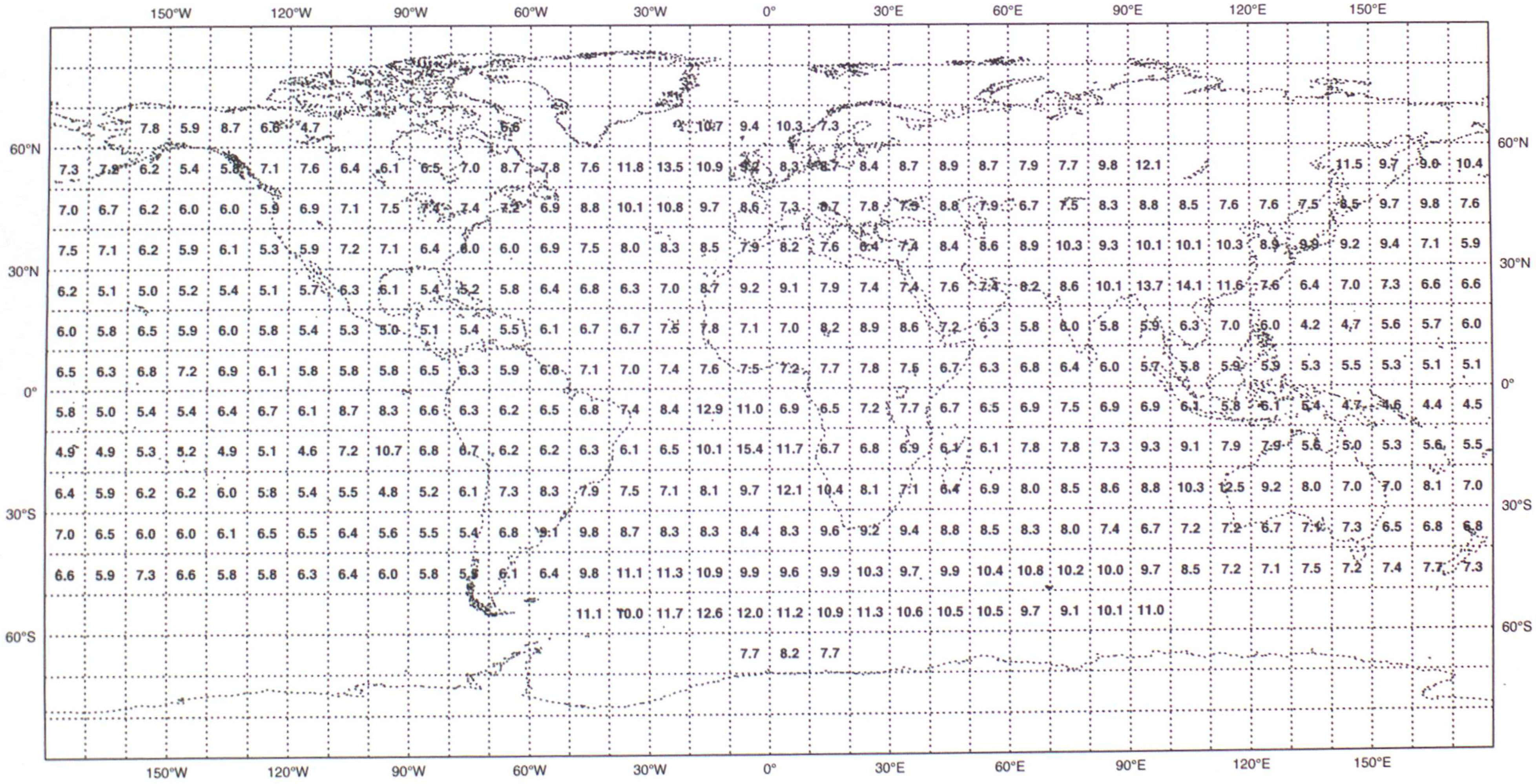
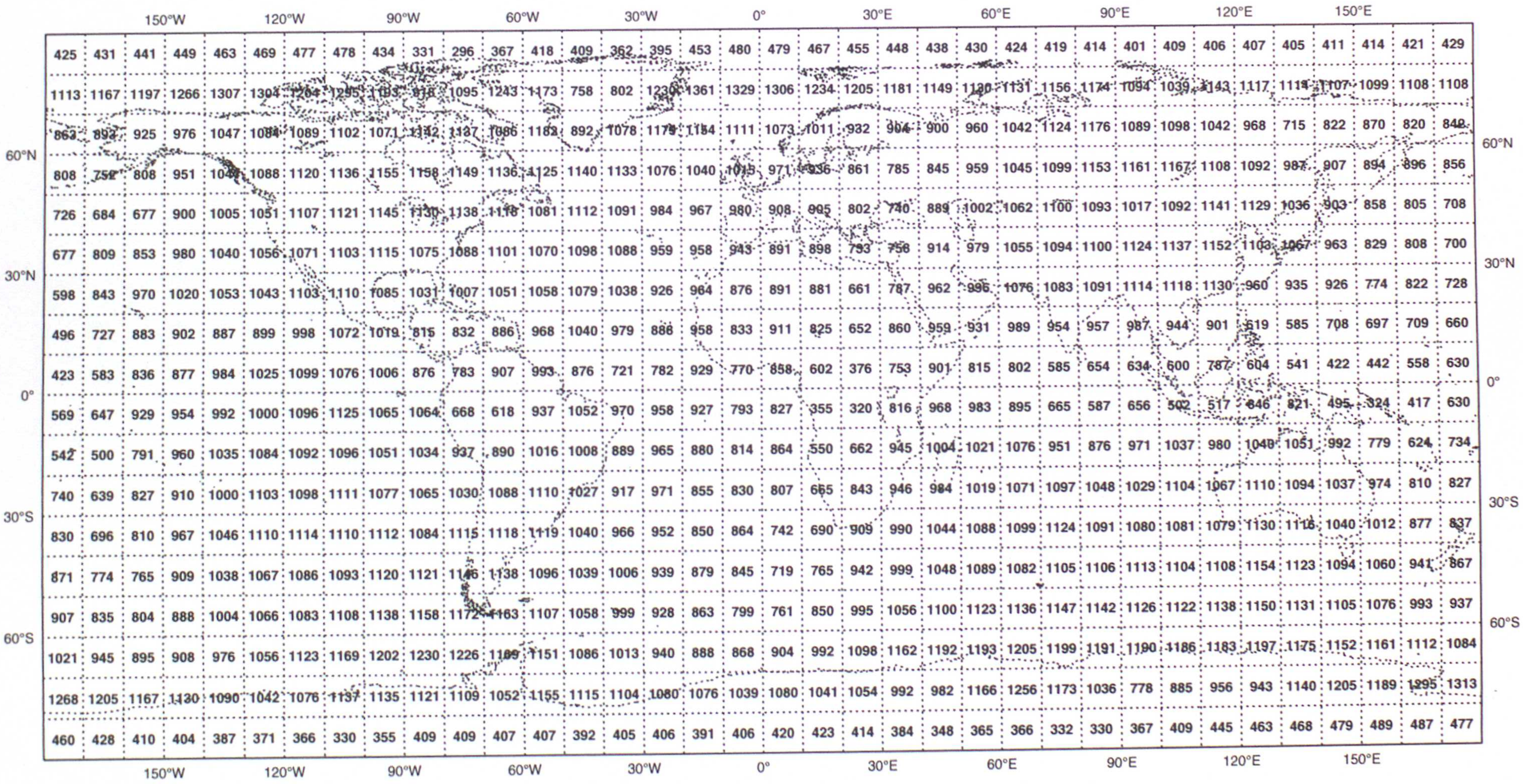
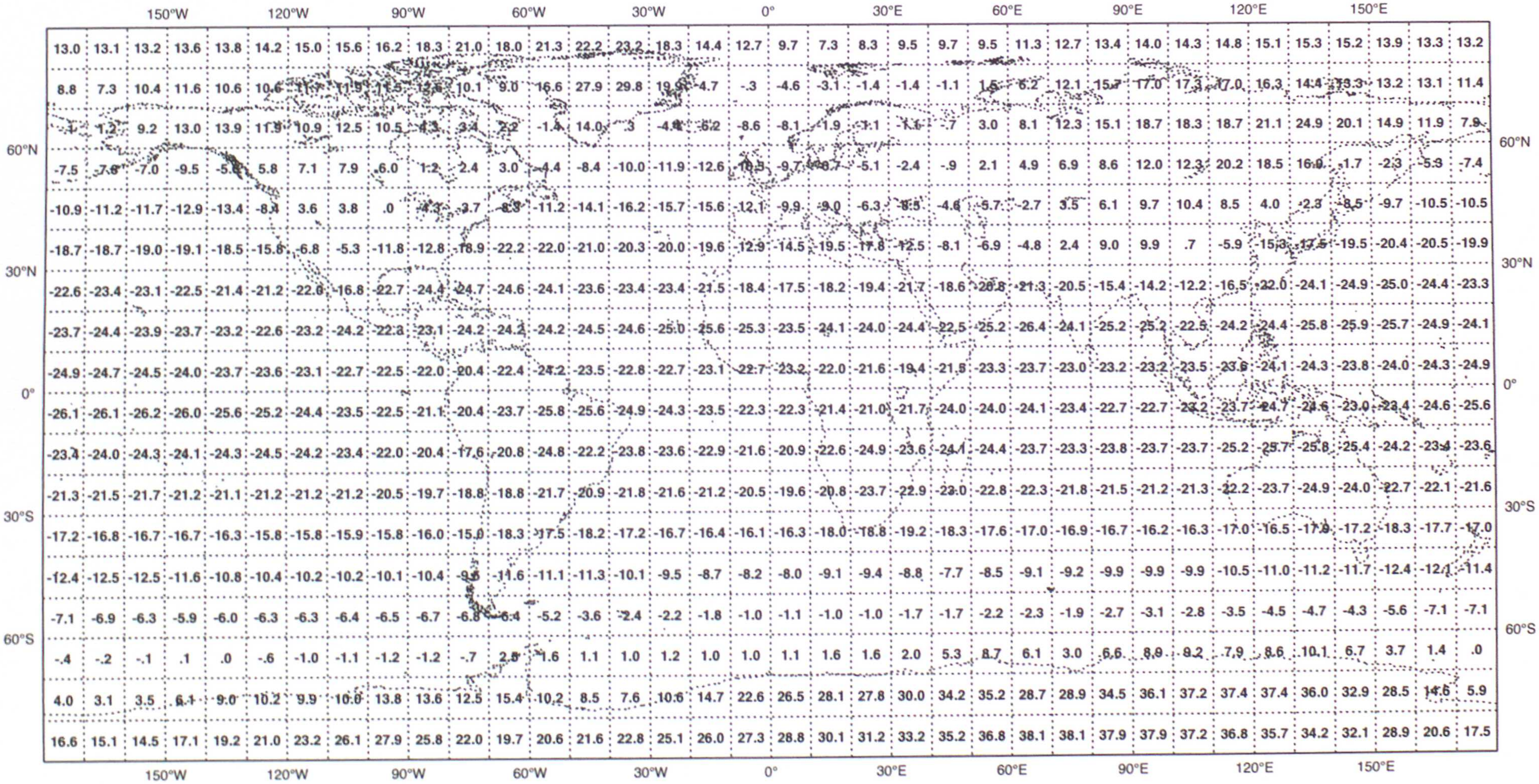

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
7.8 5.9 8.7 6.8 4.7 6.6 10.7 9.4 10.3 7.3
7.3 7.9 6.2 5.4 5.8 7.1 7.6 6.4 6.1 6.5 7.0 8.7 7.8 7.6 11.8 13.5 10.9 9.2 8.3 8.7 8.4 8.7 8.9 8.7 7.9 7.7 9.8 12.1 11.5 9.7 9.0 10.4
7.0 6.7 6.2 6.0 6.0 5.9 6.9 7.1 7.5 7.4 7.4 7.2 6.9 8.8 10.1 10.8 9.7 8.6 7.3 8.7 7.8 7.9 8.8 7.9 6.7 7.5 8.3 8.8 8.5 7.6 7.6 7.5 8.5 9.7 9.8 7.6
7.5 7.1 6.2 5.9 6.1 5.3 5.9 7.2 7.1 6.4 8.0 6.0 6.9 7.5 8.0 8.3 8.5 7.9 8.2 7.6 6.4 7.4 8.4 8.6 8.9 10.3 9.3 10.1 10.1 10.3 8.9 9.9 9.2 9.4 7.1 5.9
6.2 5.1 5.0 5.2 5.4 5.1 5.7 6.3 6.1 5.4 5.2 5.8 6.4 6.8 6.3 7.0 8.7 9.2 9.1 7.9 7.4 7.4 7.6 7.4 8.2 8.6 10.1 13.7 14.1 11.6 7.6 6.4 7.0 7.3 6.6 6.6
6.0 5.8 6.5 5.9 6.0 5.8 5.4 5.3 5.0 5.1 5.4 5.5 6.1 6.7 6.7 7.5 7.8 7.1 7.0 8.2 8.9 8.6 7.2 6.3 5.8 8.0 5.8 5.9 6.3 7.0 6.0 4.2 4.7 5.6 5.7 6.0
6.5 6.3 6.8 7.2 6.9 6.1 5.8 5.8 5.8 6.5 6.3 5.9 6.8 7.1 7.0 7.4 7.6 7.5 7.2 7.7 7.8 7.5 6.7 6.3 6.8 6.4 6.0 5.7 5.8 5.9 5.9 5.3 5.5 5.3 5.1 5.1
5.8 5.0 5.4 5.4 6.4 6.7 6.1 8.7 8.3 6.6 6.3 6.2 6.5 6.8 7.4 8.4 12.9 11.0 6.9 6.5 7.2 7.7 6.7 6.5 6.9 7.5 6.9 6.9 6.1 5.8 6.1 5.4 4.7 4.6 4.4 4.5
4.9 4.9 5.3 5.2 4.9 5.1 4.6 7.2 10.7 6.8 6.7 6.2 6.2 6.3 6.1 6.5 10.1 15.4 11.7 6.7 6.8 6.9 6.1 6.1 7.8 7.8 7.3 9.3 9.1 7.9 7.9 5.6 5.0 5.3 5.6 5.5
6.4 5.9 6.2 6.2 6.0 5.8 5.4 5.5 4.8 5.2 6.1 7.3 8.3 7.9 7.5 7.1 8.1 9.7 12.1 10.4 8.1 7.1 6.4 6.9 8.0 8.5 8.6 8.8 10.3 12.5 9.2 8.0 7.0 7.0 8.1 7.0
7.0 6.5 6.0 6.0 6.1 6.5 6.5 6.4 5.6 5.5 5.4 6.8 9.1 9.8 8.7 8.3 8.3 8.4 8.3 9.6 9.2 9.4 8.8 8.5 8.3 8.0 7.4 6.7 7.2 7.2 6.7 7.4 7.3 6.5 6.8 6.8
6.6 5.9 7.3 6.6 5.8 5.8 6.3 6.4 6.0 5.8 5.8 6.1 6.4 9.8 11.1 11.3 10.9 9.9 9.6 9.9 10.3 9.7 9.9 10.4 10.8 10.2 10.0 9.7 8.5 7.2 7.1 7.5 7.2 7.4 7.7 7.3
11.1 10.0 11.7 12.6 12.0 11.2 10.9 11.3 10.6 10.5 10.5 9.7 9.1 10.1 11.0
7.7 8.2 7.7

Figure 25. ATOVS mean daily count. NOVEMBER 2003
NOAA15, using all observations
Global average number of observations in 24 hours = 591932



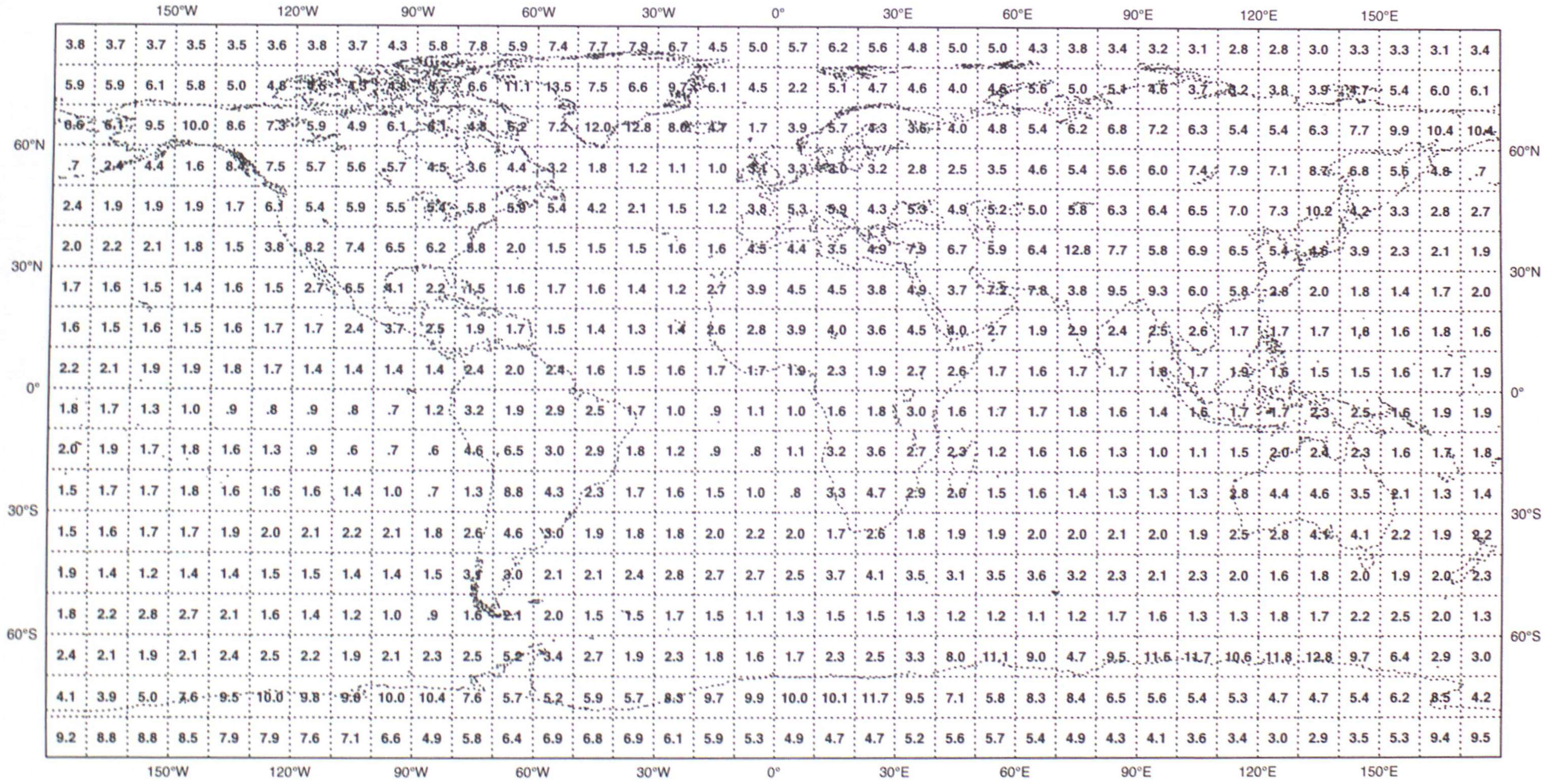
425	431	441	449	463	469	477	478	434	331	296	367	418	409	362	395	453	480	479	467	455	448	438	430	424	419	414	401	409	406	407	405	411	414	421	429
1113	1167	1197	1266	1307	1304	1264	1295	1193	918	1095	1243	1173	758	802	1230	1361	1329	1306	1234	1205	1181	1149	1120	1131	1156	1174	1094	1039	1143	1117	1114	1107	1099	1108	1108
863	892	925	976	1047	1084	1089	1102	1071	1142	1137	1086	1182	892	1078	1179	1154	1111	1073	1011	932	904	900	960	1042	1124	1176	1089	1098	1042	968	715	822	870	820	848
808	752	808	951	1048	1088	1120	1136	1155	1158	1149	1136	1125	1140	1133	1076	1040	1015	971	936	861	785	845	959	1045	1099	1153	1161	1167	1108	1092	987	907	894	896	856
726	684	677	900	1005	1051	1107	1121	1145	1130	1138	1118	1081	1112	1091	984	967	980	908	905	802	740	889	1002	1062	1100	1093	1017	1092	1141	1129	1036	903	858	805	708
677	809	853	980	1040	1056	1071	1103	1115	1075	1088	1101	1070	1098	1088	959	958	943	891	898	793	758	914	979	1055	1094	1100	1124	1137	1152	1103	1067	963	829	808	700
598	843	970	1020	1053	1043	1103	1110	1085	1031	1007	1051	1058	1079	1038	926	964	876	891	881	661	787	962	996	1076	1083	1091	1114	1118	1130	960	935	926	774	822	728
496	727	883	902	887	899	998	1072	1019	815	832	886	968	1040	979	888	958	833	911	825	652	860	959	931	989	954	957	987	944	901	619	585	708	697	709	660
423	583	836	877	984	1025	1099	1076	1006	876	783	907	993	876	721	782	929	770	858	602	376	753	901	815	802	585	654	634	600	787	604	541	422	442	558	630
569	647	929	954	992	1000	1096	1125	1065	1064	668	618	937	1052	970	958	927	793	827	355	320	816	968	983	895	665	587	656	502	517	646	821	495	324	417	630
542	500	791	960	1035	1084	1092	1096	1051	1034	937	890	1016	1008	889	965	880	814	864	550	662	945	1004	1021	1076	951	876	971	1037	980	1040	1051	992	779	624	734
740	639	827	910	1000	1103	1098	1111	1077	1065	1030	1088	1110	1027	917	971	855	830	807	665	843	946	984	1019	1071	1097	1048	1029	1104	1067	1110	1094	1037	974	810	827
830	696	810	967	1046	1110	1114	1110	1112	1084	1115	1118	1119	1040	966	952	850	864	742	690	909	990	1044	1088	1099	1124	1091	1080	1081	1079	1130	1116	1040	1012	877	837
871	774	765	909	1038	1067	1086	1093	1120	1121	1146	1138	1096	1039	1006	939	879	845	719	765	942	999	1048	1089	1082	1105	1106	1113	1104	1108	1154	1123	1094	1060	941	867
907	835	804	888	1004	1066	1083	1108	1138	1158	1172	1163	1107	1058	999	928	863	799	761	850	995	1056	1100	1123	1136	1147	1142	1126	1122	1138	1150	1131	1105	1076	993	937
1021	945	895	908	976	1056	1123	1169	1202	1230	1226	1189	1151	1086	1013	940	888	868	904	992	1098	1162	1192	1193	1205	1199	1191	1190	1186	1183	1197	1175	1152	1161	1112	1084
1268	1205	1167	1130	1090	1042	1076	1137	1135	1121	1109	1052	1155	1115	1104	1080	1076	1039	1080	1041	1054	992	982	1166	1256	1173	1036	778	885	956	943	1140	1205	1189	1295	1313
460	428	410	404	387	371	366	330	355	409	409	407	407	392	405	406	391	406	420	423	414	384	348	365	366	332	330	367	409	445	463	468	479	489	487	477

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS8 (Surface)
NOAA15, using all observations



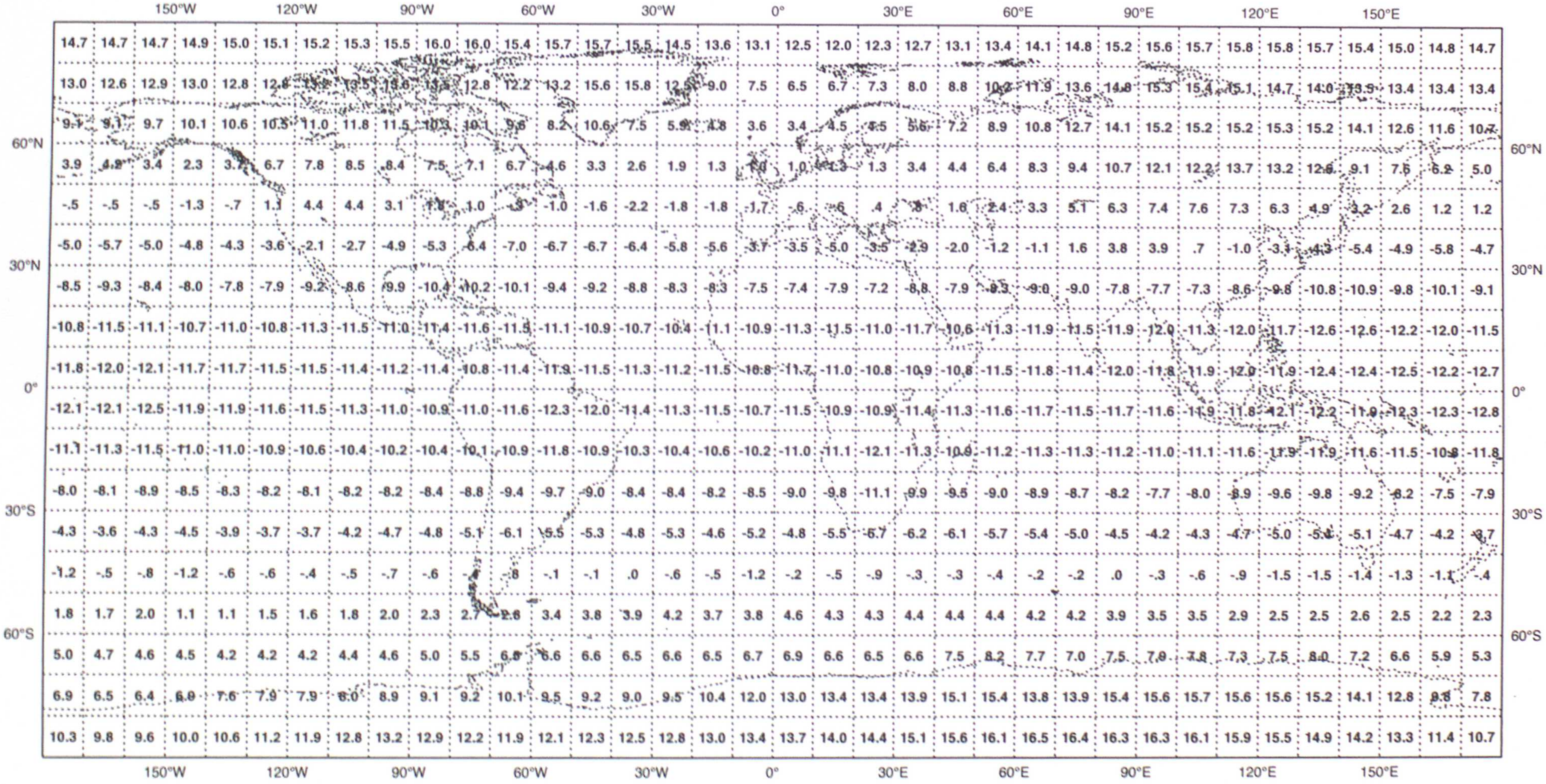
13.0	13.1	13.2	13.6	13.8	14.2	15.0	15.6	16.2	18.3	21.0	18.0	21.3	22.2	23.2	18.3	14.4	12.7	9.7	7.3	8.3	9.5	9.7	9.5	11.3	12.7	13.4	14.0	14.3	14.8	15.1	15.3	15.2	13.9	13.3	13.2
8.8	7.3	10.4	11.6	10.6	10.6	11.7	11.9	11.5	12.6	10.1	9.0	16.6	27.9	29.8	19.9	-4.7	-.3	-4.6	-3.1	-1.4	-1.4	-1.1	1.5	6.2	12.1	15.7	17.0	17.3	17.0	16.3	14.4	13.3	13.2	13.1	11.4
-.1	1.2	9.2	13.0	13.9	11.9	10.9	12.5	10.5	4.3	3.4	2.2	-1.4	14.0	.3	-4.8	-6.2	-8.6	-8.1	-1.9	-1.1	-1.6	-.7	3.0	8.1	12.3	15.1	18.7	18.3	18.7	21.1	24.9	20.1	14.9	11.9	7.9
-7.5	-7.6	-7.0	-9.5	-5.6	5.8	7.1	7.9	6.0	1.2	2.4	3.0	-4.4	-8.4	-10.0	-11.9	-12.6	-10.5	-9.7	-8.7	-5.1	-2.4	-.9	2.1	4.9	6.9	8.6	12.0	12.3	20.2	18.5	16.0	-1.7	-2.3	-5.3	-7.4
-10.9	-11.2	-11.7	-12.9	-13.4	-8.4	3.6	3.8	.0	-4.3	-3.7	-8.3	-11.2	-14.1	-16.2	-15.7	-15.6	-12.1	-9.9	-9.0	-6.3	-8.5	-4.6	-5.7	-2.7	3.5	6.1	9.7	10.4	8.5	4.0	-2.3	-8.5	-9.7	-10.5	-10.5
-18.7	-18.7	-19.0	-19.1	-18.5	-15.8	-6.8	-5.3	-11.8	-12.8	-18.9	-22.2	-22.0	-21.0	-20.3	-20.0	-19.6	-12.9	-14.5	-19.5	-17.8	-12.5	-8.1	-6.9	-4.8	2.4	9.0	9.9	.7	-5.9	-15.3	-17.5	-19.5	-20.4	-20.5	-19.9
-22.6	-23.4	-23.1	-22.5	-21.4	-21.2	-22.6	-16.8	-22.7	-24.4	-24.7	-24.6	-24.1	-23.6	-23.4	-23.4	-21.5	-18.4	-17.5	-18.2	-19.4	-21.7	-18.6	-20.8	-21.3	-20.5	-15.4	-14.2	-12.2	-16.5	-22.0	-24.1	-24.9	-25.0	-24.4	-23.3
-23.7	-24.4	-23.9	-23.7	-23.2	-22.6	-23.2	-24.2	-22.3	-23.1	-24.2	-24.2	-24.2	-24.5	-24.6	-25.0	-25.6	-25.3	-23.5	-24.1	-24.0	-24.4	-22.5	-25.2	-26.4	-24.1	-25.2	-25.2	-22.5	-24.2	-24.4	-25.8	-25.9	-25.7	-24.9	-24.1
-24.9	-24.7	-24.5	-24.0	-23.7	-23.6	-23.1	-22.7	-22.5	-22.0	-20.4	-22.4	-24.2	-23.5	-22.8	-22.7	-23.1	-22.7	-23.2	-22.0	-21.6	-19.4	-21.5	-23.3	-23.7	-23.0	-23.2	-23.2	-23.5	-23.6	-24.1	-24.3	-23.8	-24.0	-24.3	-24.9
-26.1	-26.1	-26.2	-26.0	-25.6	-25.2	-24.4	-23.5	-22.5	-21.1	-20.4	-23.7	-25.8	-25.6	-24.9	-24.3	-23.5	-22.3	-22.3	-21.4	-21.0	-21.7	-24.0	-24.0	-24.1	-23.4	-22.7	-22.7	-23.2	-23.7	-24.7	-24.6	-23.0	-23.4	-24.6	-25.6
-23.4	-24.0	-24.3	-24.1	-24.3	-24.5	-24.2	-23.4	-22.0	-20.4	-17.6	-20.8	-24.8	-22.2	-23.8	-23.6	-22.9	-21.6	-20.9	-22.6	-24.9	-23.6	-24.1	-24.4	-23.7	-23.3	-23.8	-23.7	-23.7	-25.2	-25.7	-25.8	-25.4	-24.2	-23.4	-23.6
-21.3	-21.5	-21.7	-21.2	-21.1	-21.2	-21.2	-21.2	-20.5	-19.7	-18.8	-18.8	-21.7	-20.9	-21.8	-21.6	-21.2	-20.5	-19.6	-20.8	-23.7	-22.9	-23.0	-22.8	-22.3	-21.8	-21.5	-21.2	-21.3	-22.2	-23.7	-24.9	-24.0	-22.7	-22.1	-21.6
-17.2	-16.8	-16.7	-16.7	-16.3	-15.8	-15.8	-15.9	-15.8	-16.0	-15.0	-18.3	-17.5	-18.2	-17.2	-16.7	-16.4	-16.1	-16.3	-18.0	-18.8	-19.2	-18.3	-17.6	-17.0	-16.9	-16.7	-16.2	-16.3	-17.0	-16.5	-17.9	-17.2	-18.3	-17.7	-17.0
-12.4	-12.5	-12.5	-11.6	-10.8	-10.4	-10.2	-10.2	-10.1	-10.4	-9.6	-11.6	-11.1	-11.3	-10.1	-9.5	-8.7	-8.2	-8.0	-9.1	-9.4	-8.8	-7.7	-8.5	-9.1	-9.2	-9.9	-9.9	-9.9	-10.5	-11.0	-11.2	-11.7	-12.4	-12.1	-11.4
-7.1	-6.9	-6.3	-5.9	-6.0	-6.3	-6.3	-6.4	-6.5	-6.7	-6.8	-6.4	-5.2	-3.6	-2.4	-2.2	-1.8	-1.0	-1.1	-1.0	-1.0	-1.7	-1.7	-2.2	-2.3	-1.9	-2.7	-3.1	-2.8	-3.5	-4.5	-4.7	-4.3	-5.6	-7.1	-7.1
-.4	-.2	-.1	.1	.0	-.6	-1.0	-1.1	-1.2	-1.2	-.7	2.5	1.6	1.1	1.0	1.2	1.0	1.0	1.1	1.6	1.6	2.0	5.3	8.7	6.1	3.0	6.6	8.9	9.2	7.9	8.6	10.1	6.7	3.7	1.4	.0
4.0	3.1	3.5	6.1	9.0	10.2	9.9	10.0	13.8	13.6	12.5	15.4	10.2	8.5	7.6	10.6	14.7	22.6	26.5	28.1	27.8	30.0	34.2	35.2	28.7	28.9	34.5	36.1	37.2	37.4	37.4	36.0	32.9	28.5	14.6	5.9
16.6	15.1	14.5	17.1	19.2	21.0	23.2	26.1	27.9	25.8	22.0	19.7	20.6	21.6	22.8	25.1	26.0	27.3	28.8	30.1	31.2	33.2	35.2	36.8	38.1	38.1	37.9	37.9	37.2	36.8	35.7	34.2	32.1	28.9	20.6	17.5

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS8 (Surface)
NOAA15, using all observations



3.8	3.7	3.7	3.5	3.5	3.6	3.8	3.7	4.3	5.8	7.8	5.9	7.4	7.7	7.9	6.7	4.5	5.0	5.7	6.2	5.6	4.8	5.0	5.0	4.3	3.8	3.4	3.2	3.1	2.8	2.8	3.0	3.3	3.3	3.1	3.4
5.9	5.9	6.1	5.8	5.0	4.8	9.6	4.3	4.8	6.7	6.6	11.1	13.5	7.5	6.6	9.7	6.1	4.5	2.2	5.1	4.7	4.6	4.0	4.6	5.6	5.0	5.4	4.6	3.7	3.2	3.8	3.9	4.7	5.4	6.0	6.1
6.6	6.1	9.5	10.0	8.6	7.3	5.9	4.9	6.1	6.1	4.8	5.2	7.2	12.0	12.8	8.0	4.7	1.7	3.9	5.7	4.3	3.6	4.0	4.8	5.4	6.2	6.8	7.2	6.3	5.4	5.4	6.3	7.7	9.9	10.4	10.4
.7	2.4	4.4	1.6	8.4	7.5	5.7	5.6	5.7	4.5	3.6	4.4	3.2	1.8	1.2	1.1	1.0	3.1	3.3	2.0	3.2	2.8	2.5	3.5	4.6	5.4	5.6	6.0	7.4	7.9	7.1	8.7	6.8	5.6	4.8	.7
2.4	1.9	1.9	1.9	1.7	6.1	5.4	5.9	5.5	5.4	5.8	5.9	5.4	4.2	2.1	1.5	1.2	3.8	5.3	5.9	4.3	5.3	4.9	5.2	5.0	5.8	6.3	6.4	6.5	7.0	7.3	10.2	4.2	3.3	2.8	2.7
2.0	2.2	2.1	1.8	1.5	3.8	8.2	7.4	6.5	6.2	8.8	2.0	1.5	1.5	1.5	1.6	1.6	4.5	4.4	3.5	4.9	7.9	6.7	5.9	6.4	12.8	7.7	5.8	6.9	6.5	5.4	4.6	3.9	2.3	2.1	1.9
1.7	1.6	1.5	1.4	1.6	1.5	2.7	6.5	4.1	2.2	1.5	1.6	1.7	1.6	1.4	1.2	2.7	3.9	4.5	4.5	3.8	4.9	3.7	7.2	7.8	3.8	9.5	9.3	6.0	5.8	2.8	2.0	1.8	1.4	1.7	2.0
1.6	1.5	1.6	1.5	1.6	1.7	1.7	2.4	3.7	2.5	1.9	1.7	1.5	1.4	1.3	1.4	2.6	2.8	3.9	4.0	3.6	4.5	4.0	2.7	1.9	2.9	2.4	2.5	2.6	1.7	1.7	1.7	1.8	1.6	1.8	1.6
2.2	2.1	1.9	1.9	1.8	1.7	1.4	1.4	1.4	1.4	2.4	2.0	2.4	1.6	1.5	1.6	1.7	1.7	1.9	2.3	1.9	2.7	2.6	1.7	1.6	1.7	1.7	1.8	1.7	1.9	1.6	1.5	1.5	1.6	1.7	1.9
1.8	1.7	1.3	1.0	.9	.8	.9	.8	.7	1.2	3.2	1.9	2.9	2.5	1.7	1.0	.9	1.1	1.0	1.6	1.8	3.0	1.6	1.7	1.7	1.8	1.6	1.4	1.6	1.7	1.7	2.3	2.5	1.6	1.9	1.9
2.0	1.9	1.7	1.8	1.6	1.3	.9	.6	.7	.6	4.6	6.5	3.0	2.9	1.8	1.2	.9	.8	1.1	3.2	3.6	2.7	2.3	1.2	1.6	1.6	1.3	1.0	1.1	1.5	2.0	2.4	2.3	1.6	1.7	1.8
1.5	1.7	1.7	1.8	1.6	1.6	1.6	1.4	1.0	.7	1.3	8.8	4.3	2.3	1.7	1.6	1.5	1.0	.8	3.3	4.7	2.9	2.0	1.5	1.6	1.4	1.3	1.3	1.3	2.8	4.4	4.6	3.5	2.1	1.3	1.4
1.5	1.6	1.7	1.7	1.9	2.0	2.1	2.2	2.1	1.8	2.6	4.6	3.0	1.9	1.8	1.8	2.0	2.2	2.0	1.7	2.6	1.8	1.9	1.9	2.0	2.0	2.1	2.0	1.9	2.5	2.8	4.1	4.1	2.2	1.9	2.2
1.9	1.4	1.2	1.4	1.4	1.5	1.5	1.4	1.4	1.5	3.1	3.0	2.1	2.1	2.4	2.8	2.7	2.7	2.5	3.7	4.1	3.5	3.1	3.5	3.6	3.2	2.3	2.1	2.3	2.0	1.6	1.8	2.0	1.9	2.0	2.3
1.8	2.2	2.8	2.7	2.1	1.6	1.4	1.2	1.0	.9	1.6	2.1	2.0	1.5	1.5	1.7	1.5	1.1	1.3	1.5	1.5	1.3	1.2	1.2	1.1	1.2	1.7	1.6	1.3	1.3	1.8	1.7	2.2	2.5	2.0	1.3
2.4	2.1	1.9	2.1	2.4	2.5	2.2	1.9	2.1	2.3	2.5	5.2	3.4	2.7	1.9	2.3	1.8	1.6	1.7	2.3	2.5	3.3	8.0	11.1	9.0	4.7	9.5	11.6	11.7	10.6	11.8	12.8	9.7	6.4	2.9	3.0
4.1	3.9	5.0	7.6	9.5	10.0	9.8	9.8	10.0	10.4	7.6	5.7	5.2	5.9	5.7	8.3	9.7	9.9	10.0	10.1	11.7	9.5	7.1	5.8	8.3	8.4	6.5	5.6	5.4	5.3	4.7	4.7	5.4	6.2	8.5	4.2
9.2	8.8	8.8	8.5	7.9	7.9	7.6	7.1	6.6	4.9	5.8	6.4	6.9	6.8	6.9	6.1	5.9	5.3	4.9	4.7	4.7	5.2	5.6	5.7	5.4	4.9	4.3	4.1	3.6	3.4	3.0	2.9	3.5	5.3	9.4	9.5

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



14.7	14.7	14.7	14.9	15.0	15.1	15.2	15.3	15.5	16.0	16.0	15.4	15.7	15.7	15.5	14.5	13.6	13.1	12.5	12.0	12.3	12.7	13.1	13.4	14.1	14.8	15.2	15.6	15.7	15.8	15.8	15.7	15.4	15.0	14.8	14.7
13.0	12.6	12.9	13.0	12.8	12.8	13.2	13.5	13.6	13.5	12.8	12.2	13.2	15.6	15.8	12.5	9.0	7.5	6.5	6.7	7.3	8.0	8.8	10.2	11.9	13.6	14.8	15.3	15.4	15.1	14.7	14.0	13.5	13.4	13.4	13.4
9.1	9.1	9.7	10.1	10.6	10.5	11.0	11.8	11.5	10.3	10.1	9.6	8.2	10.6	7.5	5.9	4.8	3.6	3.4	4.5	4.5	5.6	7.2	8.9	10.8	12.7	14.1	15.2	15.2	15.2	15.3	15.2	14.1	12.6	11.6	10.7
3.9	4.2	3.4	2.3	3.7	6.7	7.8	8.5	8.4	7.5	7.1	6.7	4.6	3.3	2.6	1.9	1.3	1.0	1.0	1.3	1.3	3.4	4.4	6.4	8.3	9.4	10.7	12.1	12.2	13.7	13.2	12.6	9.1	7.6	6.2	5.0
-.5	-.5	-.5	-1.3	-.7	1.1	4.4	4.4	3.1	1.8	1.0	.3	-1.0	-1.6	-2.2	-1.8	-1.8	-1.7	-.6	-.6	.4	.8	1.6	2.4	3.3	5.1	6.3	7.4	7.6	7.3	6.3	4.9	3.2	2.6	1.2	1.2
-5.0	-5.7	-5.0	-4.8	-4.3	-3.6	-2.1	-2.7	-4.9	-5.3	-6.4	-7.0	-6.7	-6.7	-6.4	-5.8	-5.6	-3.7	-3.5	-5.0	-3.5	-2.9	-2.0	-1.2	-1.1	1.6	3.8	3.9	.7	-1.0	-3.1	-4.3	-5.4	-4.9	-5.8	-4.7
-8.5	-9.3	-8.4	-8.0	-7.8	-7.9	-9.2	-8.6	-9.9	-10.4	-10.2	-10.1	-9.4	-9.2	-8.8	-8.3	-8.3	-7.5	-7.4	-7.9	-7.2	-8.8	-7.9	-9.3	-9.0	-9.0	-7.8	-7.7	-7.3	-8.6	-9.8	-10.8	-10.9	-9.8	-10.1	-9.1
-10.8	-11.5	-11.1	-10.7	-11.0	-10.8	-11.3	-11.5	-11.0	-11.4	-11.6	-11.5	-11.1	-10.9	-10.7	-10.4	-11.1	-10.9	-11.3	-11.5	-11.0	-11.7	-10.6	-11.3	-11.9	-11.5	-11.9	-12.0	-11.3	-12.0	-11.7	-12.6	-12.6	-12.2	-12.0	-11.5
-11.8	-12.0	-12.1	-11.7	-11.7	-11.5	-11.5	-11.4	-11.2	-11.4	-10.8	-11.4	-11.9	-11.5	-11.3	-11.2	-11.5	-10.8	-11.7	-11.0	-10.8	-10.9	-10.8	-11.5	-11.8	-11.4	-12.0	-11.8	-11.9	-12.0	-11.9	-12.4	-12.4	-12.5	-12.2	-12.7
-12.1	-12.1	-12.5	-11.9	-11.9	-11.6	-11.5	-11.3	-11.0	-10.9	-11.0	-11.6	-12.3	-12.0	-11.4	-11.3	-11.5	-10.7	-11.5	-10.9	-10.9	-11.4	-11.3	-11.6	-11.7	-11.5	-11.7	-11.6	-11.9	-11.8	-12.1	-12.2	-11.9	-12.3	-12.3	-12.8
-11.1	-11.3	-11.5	-11.0	-11.0	-10.9	-10.6	-10.4	-10.2	-10.4	-10.1	-10.9	-11.8	-10.9	-10.3	-10.4	-10.6	-10.2	-11.0	-11.1	-12.1	-11.3	-10.9	-11.2	-11.3	-11.3	-11.2	-11.0	-11.1	-11.6	-11.9	-11.9	-11.6	-11.5	-10.8	-11.8
-8.0	-8.1	-8.9	-8.5	-8.3	-8.2	-8.1	-8.2	-8.2	-8.4	-8.8	-9.4	-9.7	-9.0	-8.4	-8.4	-8.2	-8.5	-9.0	-9.8	-11.1	-9.9	-9.5	-9.0	-8.9	-8.7	-8.2	-7.7	-8.0	-8.9	-9.6	-9.8	-9.2	-8.2	-7.5	-7.9
-4.3	-3.6	-4.3	-4.5	-3.9	-3.7	-3.7	-4.2	-4.7	-4.8	-5.1	-6.1	-5.5	-5.3	-4.8	-5.3	-4.6	-5.2	-4.8	-5.5	-6.7	-6.2	-6.1	-5.7	-5.4	-5.0	-4.5	-4.2	-4.3	-4.7	-5.0	-5.4	-5.1	-4.7	-4.2	-3.7
-1.2	-.5	-.8	-1.2	-.6	-.6	-.4	-.5	-.7	-.6	-.4	-.8	-.1	-.1	.0	-.6	-.5	-1.2	-.2	-.5	-.9	-.3	-.3	-.4	-.2	-.2	.0	-.3	-.6	-.9	-1.5	-1.5	-1.4	-1.3	-1.1	-.4
1.8	1.7	2.0	1.1	1.1	1.5	1.6	1.8	2.0	2.3	2.7	2.6	3.4	3.8	3.9	4.2	3.7	3.8	4.6	4.3	4.3	4.4	4.4	4.4	4.2	4.2	3.9	3.5	3.5	2.9	2.5	2.5	2.6	2.5	2.2	2.3
5.0	4.7	4.6	4.5	4.2	4.2	4.2	4.4	4.6	5.0	5.5	6.8	6.6	6.6	6.5	6.6	6.5	6.7	6.9	6.6	6.5	6.6	7.5	8.2	7.7	7.0	7.5	7.9	7.8	7.3	7.5	8.0	7.2	6.6	5.9	5.3
6.9	6.5	6.4	6.9	7.6	7.9	7.9	8.0	8.9	9.1	9.2	10.1	9.5	9.2	9.0	9.5	10.4	12.0	13.0	13.4	13.4	13.9	15.1	15.4	13.8	13.9	15.4	15.6	15.7	15.6	15.6	15.2	14.1	12.8	9.8	7.8
10.3	9.8	9.6	10.0	10.6	11.2	11.9	12.8	13.2	12.9	12.2	11.9	12.1	12.3	12.5	12.8	13.0	13.4	13.7	14.0	14.4	15.1	15.6	16.1	16.5	16.4	16.3	16.3	16.1	15.9	15.5	14.9	14.2	13.3	11.4	10.7

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

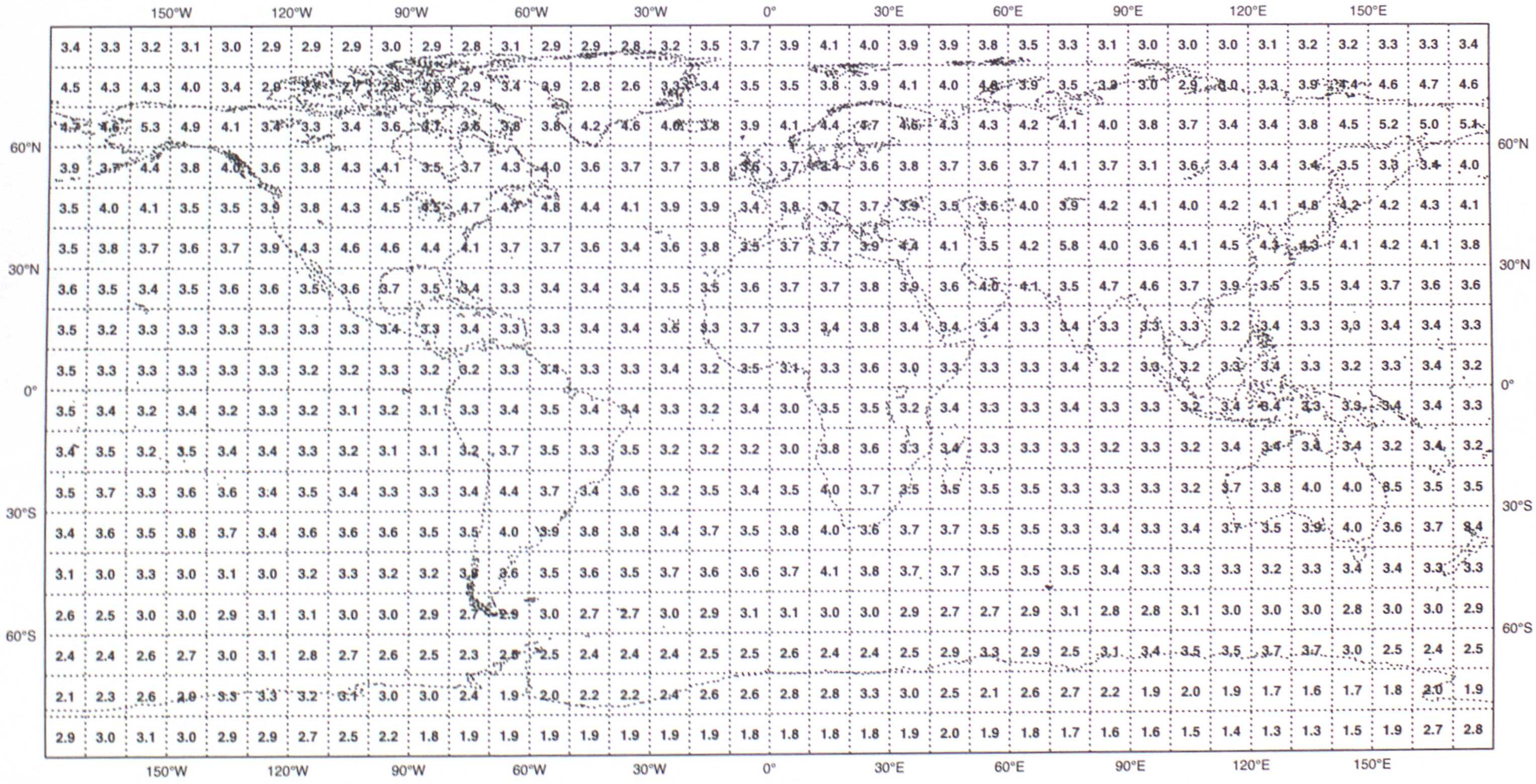
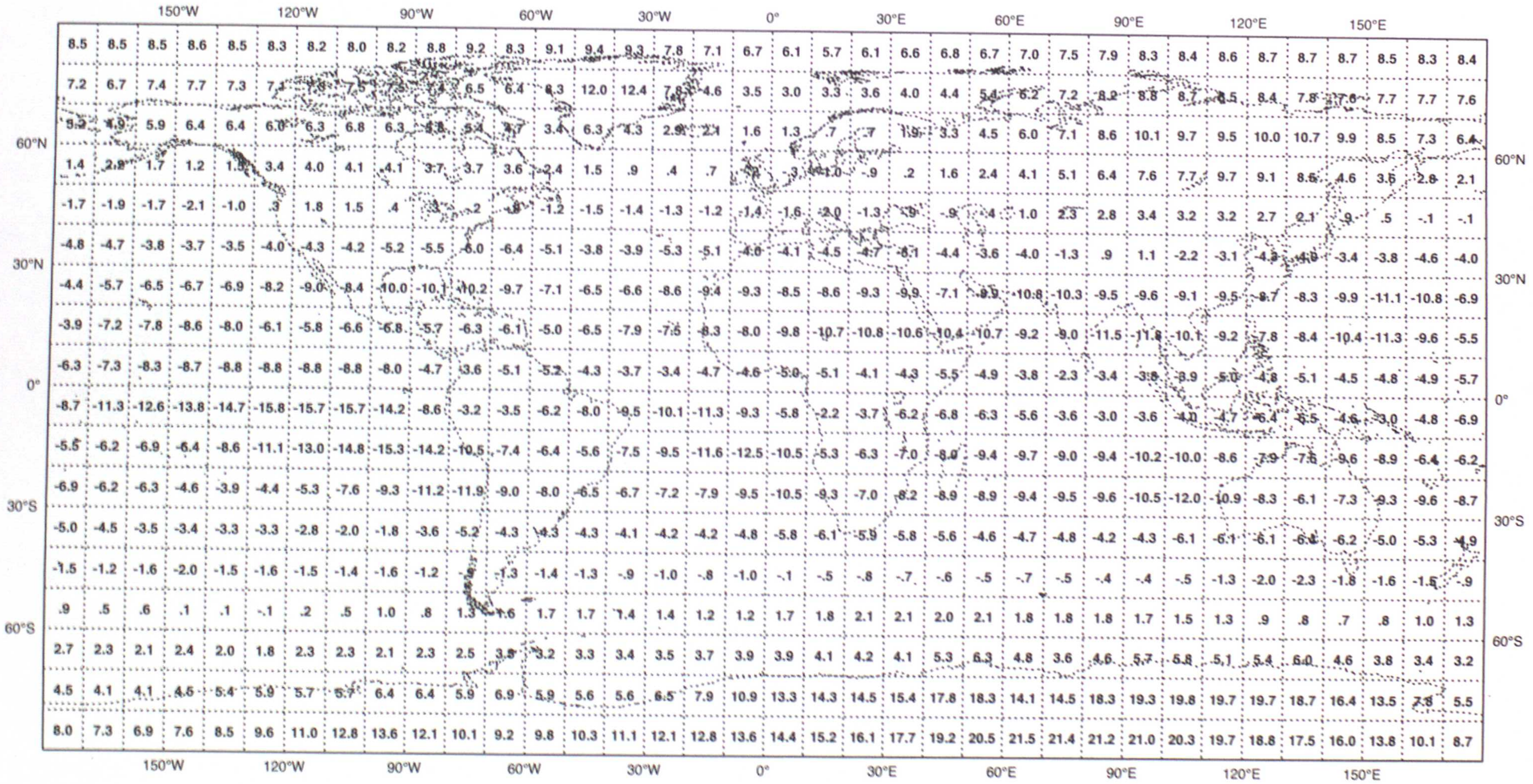
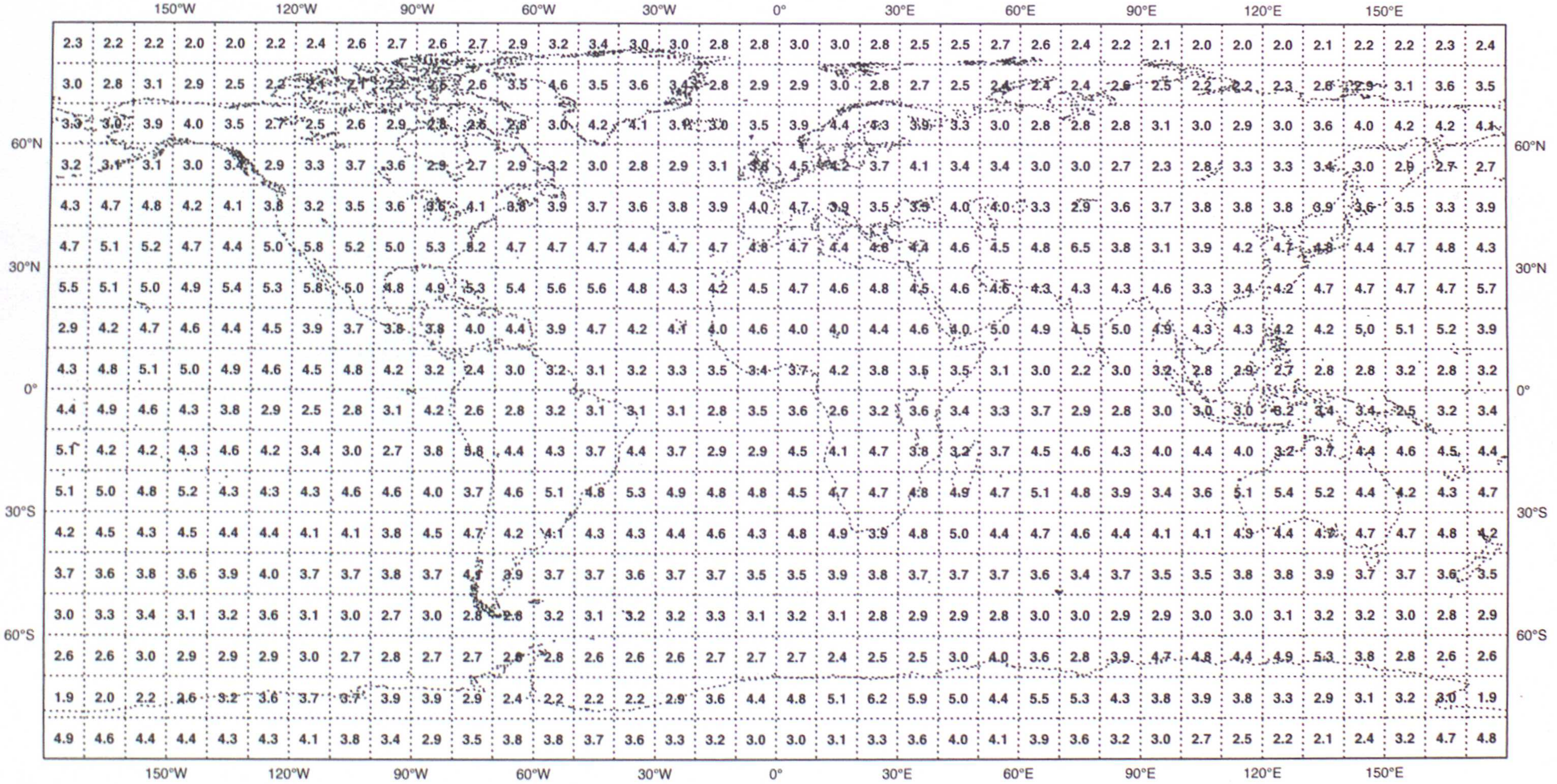

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.4 3.3 3.2 3.1 3.0 2.9 2.9 2.9 3.0 2.9 2.8 3.1 2.9 2.9 2.8 3.2 3.5 3.7 3.9 4.1 4.0 3.9 3.9 3.8 3.5 3.3 3.1 3.0 3.0 3.0 3.1 3.2 3.2 3.3 3.3 3.4
4.5 4.3 4.3 4.0 3.4 2.9 2.7 2.7 2.8 2.9 2.9 3.4 3.9 2.8 2.6 3.3 3.4 3.5 3.5 3.8 3.9 4.1 4.0 4.8 3.9 3.5 3.9 3.0 2.9 3.0 3.3 3.9 3.4 4.6 4.7 4.6
4.7 4.6 5.3 4.9 4.1 3.4 3.3 3.4 3.6 3.7 3.6 3.8 3.8 4.2 4.6 4.0 3.8 3.9 4.1 4.4 4.7 4.6 4.3 4.3 4.2 4.1 4.0 3.8 3.7 3.4 3.4 3.8 4.5 5.2 5.0 5.1
3.9 3.7 4.4 3.8 4.0 3.6 3.8 4.3 4.1 3.5 3.7 4.3 4.0 3.6 3.7 3.7 3.8 3.6 3.7 4.4 3.6 3.8 3.7 3.6 3.7 4.1 3.7 3.1 3.6 3.4 3.4 3.4 3.5 3.3 3.4 4.0
3.5 4.0 4.1 3.5 3.5 3.9 3.8 4.3 4.5 4.5 4.7 4.7 4.8 4.4 4.1 3.9 3.9 3.4 3.8 3.7 3.7 3.9 3.5 3.6 4.0 3.9 4.2 4.1 4.0 4.2 4.1 4.8 4.2 4.2 4.3 4.1
3.5 3.8 3.7 3.6 3.7 3.9 4.3 4.6 4.6 4.4 4.1 3.7 3.7 3.6 3.4 3.6 3.8 3.5 3.7 3.7 3.9 4.4 4.1 3.5 4.2 5.8 4.0 3.6 4.1 4.5 4.3 4.3 4.1 4.2 4.1 3.8
3.6 3.5 3.4 3.5 3.6 3.6 3.5 3.6 3.7 3.5 3.4 3.3 3.4 3.4 3.4 3.5 3.5 3.6 3.7 3.7 3.8 3.9 3.6 4.0 4.1 3.5 4.7 4.6 3.7 3.9 3.5 3.5 3.4 3.7 3.6 3.6
3.5 3.2 3.3 3.3 3.3 3.3 3.3 3.3 3.4 3.3 3.4 3.3 3.3 3.4 3.4 3.5 3.3 3.7 3.3 3.4 3.8 3.4 3.4 3.4 3.3 3.4 3.3 3.3 3.3 3.2 3.4 3.3 3.3 3.4 3.4 3.3
3.5 3.3 3.3 3.3 3.3 3.3 3.2 3.2 3.3 3.2 3.2 3.3 3.4 3.3 3.3 3.4 3.2 3.5 3.1 3.3 3.6 3.0 3.3 3.3 3.3 3.4 3.2 3.3 3.2 3.3 3.4 3.3 3.2 3.3 3.4 3.2
3.5 3.4 3.2 3.4 3.2 3.3 3.2 3.1 3.2 3.1 3.3 3.4 3.5 3.4 3.4 3.3 3.2 3.4 3.0 3.5 3.5 3.2 3.4 3.3 3.3 3.4 3.3 3.3 3.2 3.4 3.4 3.3 3.9 3.4 3.4 3.3
3.4 3.5 3.2 3.5 3.4 3.4 3.3 3.2 3.1 3.1 3.2 3.7 3.5 3.3 3.5 3.2 3.2 3.2 3.0 3.8 3.6 3.3 3.4 3.3 3.3 3.3 3.2 3.3 3.2 3.4 3.4 3.4 3.4 3.2 3.4 3.2
3.5 3.7 3.3 3.6 3.6 3.4 3.5 3.4 3.3 3.3 3.4 4.4 3.7 3.4 3.6 3.2 3.5 3.4 3.5 4.0 3.7 3.5 3.5 3.5 3.5 3.3 3.3 3.3 3.2 3.7 3.8 4.0 4.0 3.5 3.5 3.5
3.4 3.6 3.5 3.8 3.7 3.4 3.6 3.6 3.6 3.5 3.5 4.0 3.9 3.8 3.8 3.4 3.7 3.5 3.8 4.0 3.6 3.7 3.7 3.5 3.5 3.3 3.4 3.3 3.4 3.7 3.5 3.9 4.0 3.6 3.7 3.4
3.1 3.0 3.3 3.0 3.1 3.0 3.2 3.3 3.2 3.2 3.8 3.6 3.5 3.6 3.5 3.7 3.6 3.6 3.7 4.1 3.8 3.7 3.7 3.5 3.5 3.5 3.4 3.3 3.3 3.3 3.2 3.3 3.4 3.4 3.3 3.3
2.6 2.5 3.0 3.0 2.9 3.1 3.1 3.0 3.0 2.9 2.7 2.9 3.0 2.7 2.7 3.0 2.9 3.1 3.1 3.0 3.0 2.9 2.7 2.7 2.9 3.1 2.8 2.8 3.1 3.0 3.0 3.0 2.8 3.0 3.0 2.9
2.4 2.4 2.6 2.7 3.0 3.1 2.8 2.7 2.6 2.5 2.3 2.5 2.5 2.4 2.4 2.4 2.5 2.5 2.6 2.4 2.4 2.5 2.9 3.3 2.9 2.5 3.1 3.4 3.5 3.5 3.7 3.7 3.0 2.5 2.4 2.5
2.1 2.3 2.6 2.9 3.3 3.3 3.2 3.1 3.0 3.0 2.4 1.9 2.0 2.2 2.2 2.4 2.6 2.6 2.8 2.8 3.3 3.0 2.5 2.1 2.6 2.7 2.2 1.9 2.0 1.9 1.7 1.6 1.7 1.8 2.0 1.9
2.9 3.0 3.1 3.0 2.9 2.9 2.7 2.5 2.2 1.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.8 1.8 1.8 1.8 1.9 2.0 1.9 1.8 1.7 1.6 1.6 1.5 1.4 1.3 1.3 1.5 1.9 2.7 2.8

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



8.5	8.5	8.5	8.6	8.5	8.3	8.2	8.0	8.2	8.8	9.2	8.3	9.1	9.4	9.3	7.8	7.1	6.7	6.1	5.7	6.1	6.6	6.8	6.7	7.0	7.5	7.9	8.3	8.4	8.6	8.7	8.7	8.7	8.5	8.3	8.4
7.2	6.7	7.4	7.7	7.3	7.4	7.8	7.5	7.5	7.4	6.5	6.4	8.3	12.0	12.4	7.8	4.6	3.5	3.0	3.3	3.6	4.0	4.4	5.4	6.2	7.2	8.2	8.8	8.7	8.5	8.4	7.8	7.6	7.7	7.7	7.6
5.2	4.9	5.9	6.4	6.4	6.0	6.3	6.8	6.3	5.8	5.4	4.7	3.4	6.3	4.3	2.9	2.1	1.6	1.3	.7	.7	1.9	3.3	4.5	6.0	7.1	8.6	10.1	9.7	9.5	10.0	10.7	9.9	8.5	7.3	6.4
1.4	2.8	1.7	1.2	1.5	3.4	4.0	4.1	4.1	3.7	3.7	3.6	2.4	1.5	.9	.4	.7	[illegible]	-.3	-1.0	-.9	.2	1.6	2.4	4.1	5.1	6.4	7.6	7.7	9.7	9.1	8.6	4.6	3.6	2.8	2.1
-1.7	-1.9	-1.7	-2.1	-1.0	.3	1.8	1.5	.4	.3	.2	-.8	-1.2	-1.5	-1.4	-1.3	-1.2	-1.4	-1.6	-2.0	-1.3	-.9	-.9	-.4	1.0	2.3	2.8	3.4	3.2	3.2	2.7	2.1	.9	.5	-.1	-.1
-4.8	-4.7	-3.8	-3.7	-3.5	-4.0	-4.3	-4.2	-5.2	-5.5	-6.0	-6.4	-5.1	-3.8	-3.9	-5.3	-5.1	-4.0	-4.1	-4.5	-4.7	-6.1	-4.4	-3.6	-4.0	-1.3	.9	1.1	-2.2	-3.1	-4.3	-4.0	-3.4	-3.8	-4.6	-4.0
-4.4	-5.7	-6.5	-6.7	-6.9	-8.2	-9.0	-8.4	-10.0	-10.1	-10.2	-9.7	-7.1	-6.5	-6.6	-8.6	-9.4	-9.3	-8.5	-8.6	-9.3	-9.9	-7.1	-9.9	-10.8	-10.3	-9.5	-9.6	-9.1	-9.5	-8.7	-8.3	-9.9	-11.1	-10.8	-6.9
-3.9	-7.2	-7.8	-8.6	-8.0	-6.1	-5.8	-6.6	-6.8	-5.7	-6.3	-6.1	-5.0	-6.5	-7.9	-7.5	-8.3	-8.0	-9.8	-10.7	-10.8	-10.6	-10.4	-10.7	-9.2	-9.0	-11.5	-11.8	-10.1	-9.2	-7.8	-8.4	-10.4	-11.3	-9.6	-5.5
-6.3	-7.3	-8.3	-8.7	-8.8	-8.8	-8.8	-8.8	-8.0	-4.7	-3.6	-5.1	-5.2	-4.3	-3.7	-3.4	-4.7	-4.6	-5.0	-5.1	-4.1	-4.3	-5.5	-4.9	-3.8	-2.3	-3.4	-3.8	-3.9	-5.0	-4.8	-5.1	-4.5	-4.8	-4.9	-5.7
-8.7	-11.3	-12.6	-13.8	-14.7	-15.8	-15.7	-15.7	-14.2	-8.6	-3.2	-3.5	-6.2	-8.0	-9.5	-10.1	-11.3	-9.3	-5.8	-2.2	-3.7	-6.2	-6.8	-6.3	-5.6	-3.6	-3.0	-3.6	-4.0	-4.7	-6.4	-6.5	-4.6	-3.0	-4.8	-6.9
-5.5	-6.2	-6.9	-6.4	-8.6	-11.1	-13.0	-14.8	-15.3	-14.2	-10.5	-7.4	-6.4	-5.6	-7.5	-9.5	-11.6	-12.5	-10.5	-5.3	-6.3	-7.0	-8.0	-9.4	-9.7	-9.0	-9.4	-10.2	-10.0	-8.6	-7.9	-7.6	-9.6	-8.9	-6.4	-6.2
-6.9	-6.2	-6.3	-4.6	-3.9	-4.4	-5.3	-7.6	-9.3	-11.2	-11.9	-9.0	-8.0	-6.5	-6.7	-7.2	-7.9	-9.5	-10.5	-9.3	-7.0	-8.2	-8.9	-8.9	-9.4	-9.5	-9.6	-10.5	-12.0	-10.9	-8.3	-6.1	-7.3	-9.3	-9.6	-8.7
-5.0	-4.5	-3.5	-3.4	-3.3	-3.3	-2.8	-2.0	-1.8	-3.6	-5.2	-4.3	-4.3	-4.3	-4.1	-4.2	-4.2	-4.8	-5.8	-6.1	-5.9	-5.8	-5.6	-4.6	-4.7	-4.8	-4.2	-4.3	-6.1	-6.1	-6.1	-6.4	-6.2	-5.0	-5.3	-4.9
-1.5	-1.2	-1.6	-2.0	-1.5	-1.6	-1.5	-1.4	-1.6	-1.2	-.9	-1.3	-1.4	-1.3	-.9	-1.0	-.8	-1.0	-.1	-.5	-.8	-.7	-.6	-.5	-.7	-.5	-.4	-.4	-.5	-1.3	-2.0	-2.3	-1.8	-1.6	-1.5	-.9
.9	.5	.6	.1	.1	-.1	.2	.5	1.0	.8	1.3	1.6	1.7	1.7	1.4	1.4	1.2	1.2	1.7	1.8	2.1	2.1	2.0	2.1	1.8	1.8	1.8	1.7	1.5	1.3	.9	.8	.7	.8	1.0	1.3
2.7	2.3	2.1	2.4	2.0	1.8	2.3	2.3	2.1	2.3	2.5	3.5	3.2	3.3	3.4	3.5	3.7	3.9	3.9	4.1	4.2	4.1	5.3	6.3	4.8	3.6	4.6	5.7	5.8	5.1	5.4	6.0	4.6	3.8	3.4	3.2
4.5	4.1	4.1	4.5	5.4	5.9	5.7	5.7	6.4	6.4	5.9	6.9	5.9	5.6	5.6	6.5	7.9	10.9	13.3	14.3	14.5	15.4	17.8	18.3	14.1	14.5	18.3	19.3	19.8	19.7	19.7	18.7	16.4	13.5	7.8	5.5
8.0	7.3	6.9	7.6	8.5	9.6	11.0	12.8	13.6	12.1	10.1	9.2	9.8	10.3	11.1	12.1	12.8	13.6	14.4	15.2	16.1	17.7	19.2	20.5	21.5	21.4	21.2	21.0	20.3	19.7	18.8	17.5	16.0	13.8	10.1	8.7

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



2.3	2.2	2.2	2.0	2.0	2.2	2.4	2.6	2.7	2.6	2.7	2.9	3.2	3.4	3.0	3.0	2.8	2.8	3.0	3.0	2.8	2.5	2.5	2.7	2.6	2.4	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.4
3.0	2.8	3.1	2.9	2.5	2.2	2.1	2.1	2.2	2.5	2.6	3.5	4.6	3.5	3.6	3.4	2.8	2.9	2.9	3.0	2.8	2.7	2.5	2.4	2.4	2.4	2.6	2.5	2.2	2.2	2.3	2.6	2.9	3.1	3.6	3.5
3.3	3.0	3.9	4.0	3.5	2.7	2.5	2.6	2.9	2.8	2.6	2.8	3.0	4.2	4.1	3.1	3.0	3.5	3.9	4.4	4.3	3.9	3.3	3.0	2.8	2.8	2.8	3.1	3.0	2.9	3.0	3.6	4.0	4.2	4.2	4.1
3.2	3.1	3.1	3.0	3.4	2.9	3.3	3.7	3.6	2.9	2.7	2.9	3.2	3.0	2.8	2.9	3.1	3.8	4.5	4.2	3.7	4.1	3.4	3.4	3.0	3.0	2.7	2.3	2.8	3.3	3.3	3.4	3.0	2.9	2.7	2.7
4.3	4.7	4.8	4.2	4.1	3.8	3.2	3.5	3.6	3.6	4.1	3.8	3.9	3.7	3.6	3.8	3.9	4.0	4.7	3.9	3.5	3.5	4.0	4.0	3.3	2.9	3.6	3.7	3.8	3.8	3.8	3.9	3.6	3.5	3.3	3.9
4.7	5.1	5.2	4.7	4.4	5.0	5.8	5.2	5.0	5.3	5.2	4.7	4.7	4.7	4.4	4.7	4.7	4.8	4.7	4.4	4.6	4.4	4.6	4.5	4.8	6.5	3.8	3.1	3.9	4.2	4.7	4.8	4.4	4.7	4.8	4.3
5.5	5.1	5.0	4.9	5.4	5.3	5.8	5.0	4.8	4.9	5.3	5.4	5.6	5.6	4.8	4.3	4.2	4.5	4.7	4.6	4.8	4.5	4.6	4.6	4.3	4.3	4.3	4.6	3.3	3.4	4.2	4.7	4.7	4.7	4.7	5.7
2.9	4.2	4.7	4.6	4.4	4.5	3.9	3.7	3.8	3.8	4.0	4.4	3.9	4.7	4.2	4.1	4.0	4.6	4.0	4.0	4.4	4.6	4.0	5.0	4.9	4.5	5.0	4.9	4.3	4.3	4.2	4.2	5.0	5.1	5.2	3.9
4.3	4.8	5.1	5.0	4.9	4.6	4.5	4.8	4.2	3.2	2.4	3.0	3.2	3.1	3.2	3.3	3.5	3.4	3.7	4.2	3.8	3.5	3.5	3.1	3.0	2.2	3.0	3.2	2.8	2.9	2.7	2.8	2.8	3.2	2.8	3.2
4.4	4.9	4.6	4.3	3.8	2.9	2.5	2.8	3.1	4.2	2.6	2.8	3.2	3.1	3.1	3.1	2.8	3.5	3.6	2.6	3.2	3.6	3.4	3.3	3.7	2.9	2.8	3.0	3.0	3.0	3.2	3.4	3.4	2.5	3.2	3.4
5.1	4.2	4.2	4.3	4.6	4.2	3.4	3.0	2.7	3.8	3.8	4.4	4.3	3.7	4.4	3.7	2.9	2.9	4.5	4.1	4.7	3.8	3.2	3.7	4.5	4.6	4.3	4.0	4.4	4.0	3.2	3.7	4.4	4.6	4.5	4.4
5.1	5.0	4.8	5.2	4.3	4.3	4.3	4.6	4.6	4.0	3.7	4.6	5.1	4.8	5.3	4.9	4.8	4.8	4.5	4.7	4.7	4.8	4.9	4.7	5.1	4.8	3.9	3.4	3.6	5.1	5.4	5.2	4.4	4.2	4.3	4.7
4.2	4.5	4.3	4.5	4.4	4.4	4.1	4.1	3.8	4.5	4.7	4.2	4.1	4.3	4.3	4.4	4.6	4.3	4.8	4.9	3.9	4.8	5.0	4.4	4.7	4.6	4.4	4.1	4.1	4.9	4.4	4.2	4.7	4.7	4.8	4.2
3.7	3.6	3.8	3.6	3.9	4.0	3.7	3.7	3.8	3.7	4.1	3.9	3.7	3.7	3.6	3.7	3.7	3.5	3.5	3.9	3.8	3.7	3.7	3.7	3.6	3.4	3.7	3.5	3.5	3.8	3.8	3.9	3.7	3.7	3.6	3.5
3.0	3.3	3.4	3.1	3.2	3.6	3.1	3.0	2.7	3.0	2.8	2.8	3.2	3.1	3.2	3.2	3.3	3.1	3.2	3.1	2.8	2.9	2.9	2.8	3.0	3.0	2.9	2.9	3.0	3.0	3.1	3.2	3.2	3.0	2.8	2.9
2.6	2.6	3.0	2.9	2.9	2.9	3.0	2.7	2.8	2.7	2.7	2.8	2.8	2.6	2.6	2.6	2.7	2.7	2.7	2.4	2.5	2.5	3.0	4.0	3.6	2.8	3.9	4.7	4.8	4.4	4.9	5.3	3.8	2.8	2.6	2.6
1.9	2.0	2.2	2.6	3.2	3.6	3.7	3.7	3.9	3.9	2.9	2.4	2.2	2.2	2.2	2.9	3.6	4.4	4.8	5.1	6.2	5.9	5.0	4.4	5.5	5.3	4.3	3.8	3.9	3.8	3.3	2.9	3.1	3.2	3.0	1.9
4.9	4.6	4.4	4.4	4.3	4.3	4.1	3.8	3.4	2.9	3.5	3.8	3.8	3.7	3.6	3.3	3.2	3.0	3.0	3.1	3.3	3.6	4.0	4.1	3.9	3.6	3.2	3.0	2.7	2.5	2.2	2.1	2.4	3.2	4.7	4.8

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

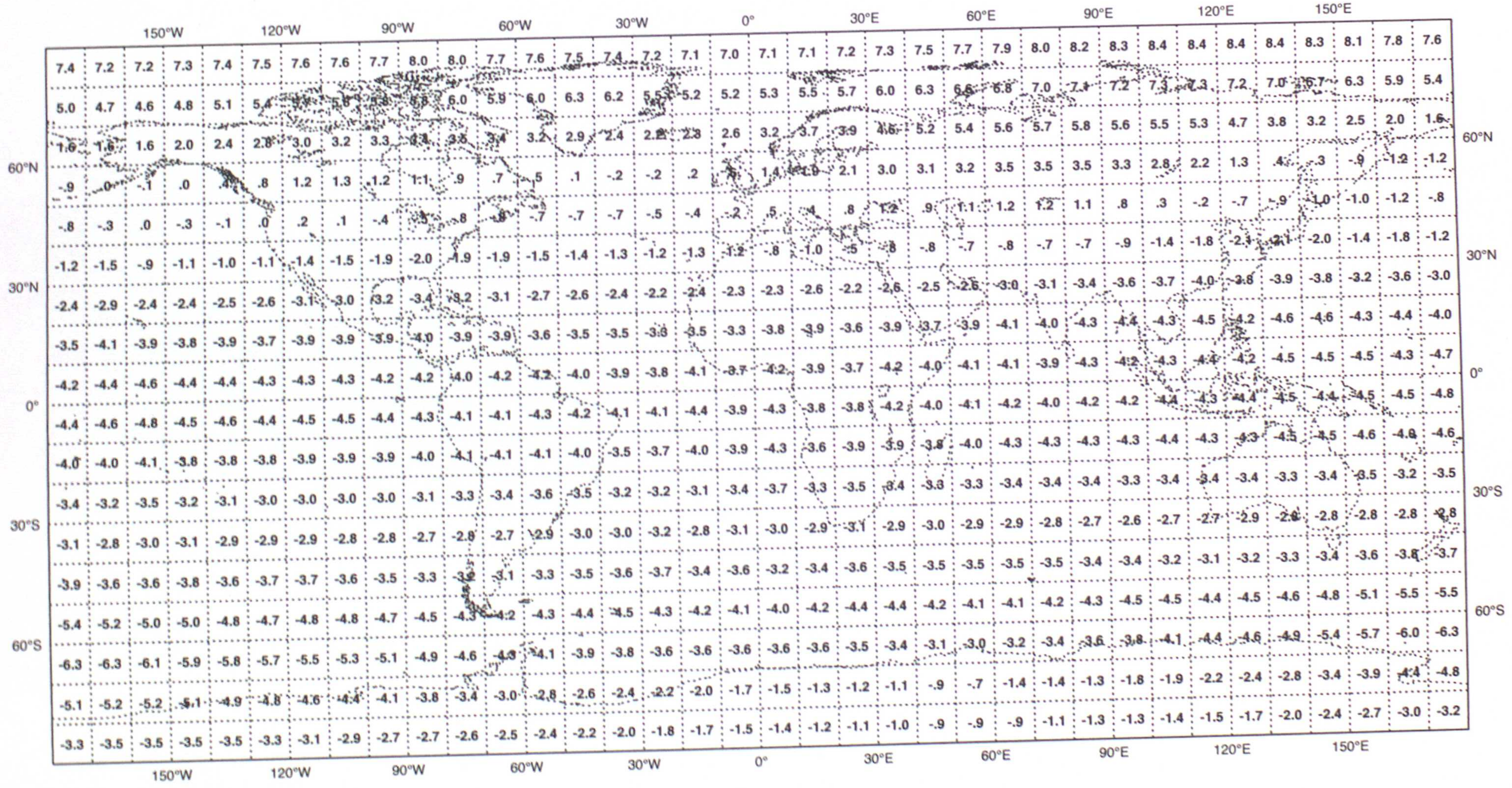
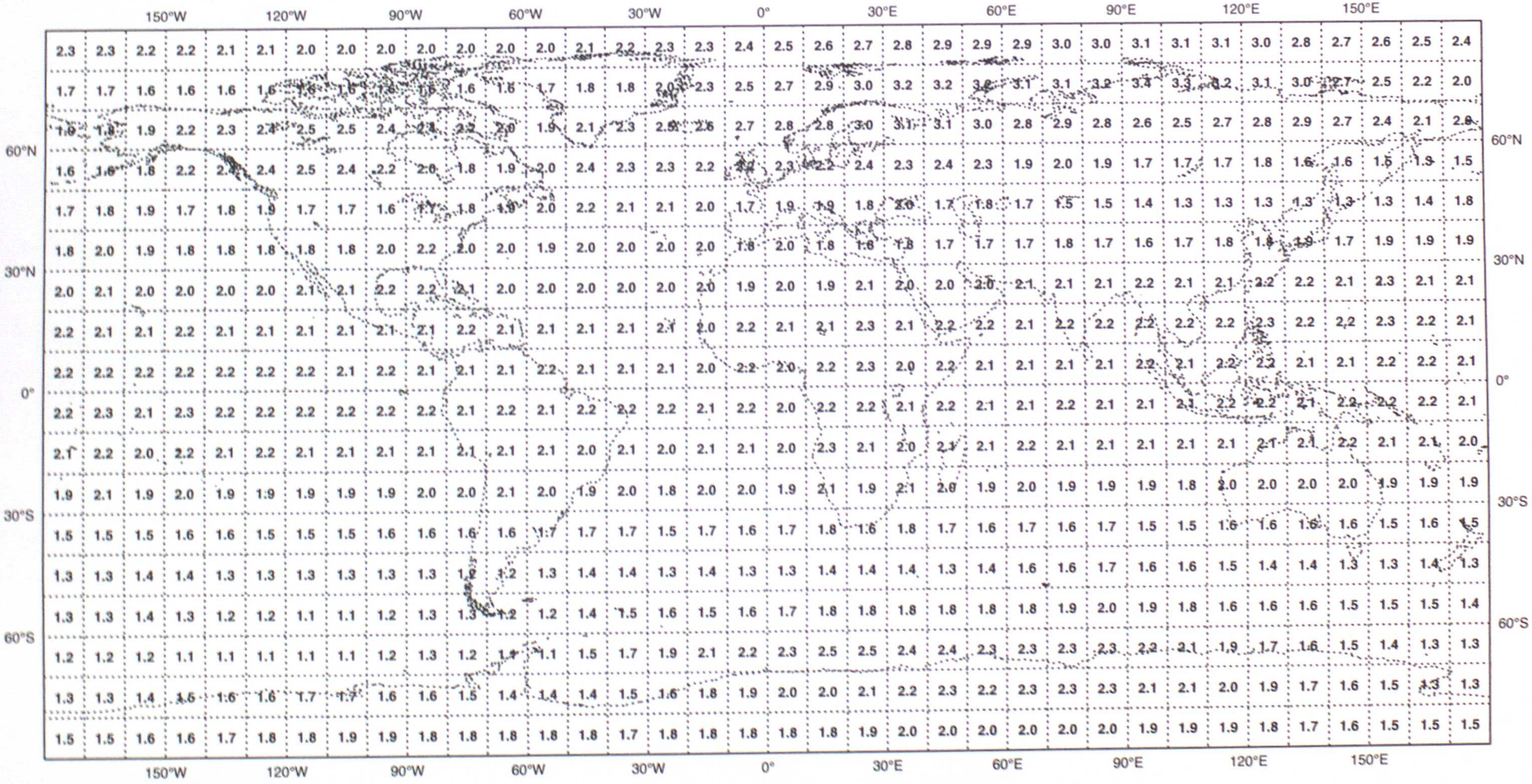

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
7.4 7.2 7.2 7.3 7.4 7.5 7.6 7.6 7.7 8.0 8.0 7.7 7.6 7.5 7.4 7.2 7.1 7.0 7.1 7.1 7.2 7.3 7.5 7.7 7.9 8.0 8.2 8.3 8.4 8.4 8.4 8.4 8.3 8.1 7.8 7.6
5.0 4.7 4.6 4.8 5.1 5.4 5.9 5.8 5.8 5.8 6.0 5.9 6.0 6.3 6.2 5.5 5.2 5.2 5.3 5.5 5.7 6.0 6.3 6.6 6.8 7.0 7.1 7.2 7.3 7.3 7.2 7.0 6.7 6.3 5.9 5.4
1.6 1.6 1.6 2.0 2.4 2.8 3.0 3.2 3.3 3.4 3.5 3.4 3.2 2.9 2.4 2.2 2.3 2.6 3.2 3.7 3.9 4.6 5.2 5.4 5.6 5.7 5.8 5.6 5.5 5.3 4.7 3.8 3.2 2.5 2.0 1.6
-.9 .0 -.1 .0 .4 .8 1.2 1.3 1.2 1.1 .9 .7 .5 .1 -.2 -.2 .2 .6 1.4 1.9 2.1 3.0 3.1 3.2 3.5 3.5 3.5 3.3 2.8 2.2 1.3 .4 .3 -.9 -1.2 -1.2
-.8 -.3 .0 -.3 -.1 .0 .2 .1 -.4 -.5 -.8 -.8 -.7 -.7 -.7 -.5 -.4 -.2 .5 .4 .8 1.2 .9 1.1 1.2 1.2 1.1 .8 .3 -.2 -.7 -.9 -1.0 -1.0 -1.2 -.8
-1.2 -1.5 -.9 -1.1 -1.0 -1.1 -1.4 -1.5 -1.9 -2.0 -1.9 -1.9 -1.5 -1.4 -1.3 -1.2 -1.3 -1.2 -.8 -1.0 -.5 -.8 -.8 -.7 -.8 -.7 -.7 -.9 -1.4 -1.8 -2.1 -2.1 -2.0 -1.4 -1.8 -1.2
-2.4 -2.9 -2.4 -2.4 -2.5 -2.6 -3.1 -3.0 -3.2 -3.4 -3.2 -3.1 -2.7 -2.6 -2.4 -2.2 -2.4 -2.3 -2.3 -2.6 -2.2 -2.6 -2.5 -2.6 -3.0 -3.1 -3.4 -3.6 -3.7 -4.0 -3.8 -3.9 -3.8 -3.2 -3.6 -3.0
-3.5 -4.1 -3.9 -3.8 -3.9 -3.7 -3.9 -3.9 -3.9 -4.0 -3.9 -3.9 -3.6 -3.5 -3.5 -3.8 -3.5 -3.3 -3.8 -3.9 -3.6 -3.9 -3.7 -3.9 -4.1 -4.0 -4.3 -4.4 -4.3 -4.5 -4.2 -4.6 -4.6 -4.3 -4.4 -4.0
-4.2 -4.4 -4.6 -4.4 -4.4 -4.3 -4.3 -4.3 -4.2 -4.2 -4.0 -4.2 -4.2 -4.0 -3.9 -3.8 -4.1 -3.7 -4.2 -3.9 -3.7 -4.2 -4.0 -4.1 -4.1 -3.9 -4.3 -4.2 -4.3 -4.4 -4.2 -4.5 -4.5 -4.5 -4.3 -4.7
-4.4 -4.6 -4.8 -4.5 -4.6 -4.4 -4.5 -4.5 -4.4 -4.3 -4.1 -4.1 -4.3 -4.2 -4.1 -4.1 -4.4 -3.9 -4.3 -3.8 -3.8 -4.2 -4.0 -4.1 -4.2 -4.0 -4.2 -4.2 -4.4 -4.3 -4.4 -4.5 -4.4 -4.5 -4.5 -4.8
-4.0 -4.0 -4.1 -3.8 -3.8 -3.8 -3.9 -3.9 -3.9 -4.0 -4.1 -4.1 -4.1 -4.0 -3.5 -3.7 -4.0 -3.9 -4.3 -3.6 -3.9 -3.9 -3.8 -4.0 -4.3 -4.3 -4.3 -4.3 -4.4 -4.3 -4.3 -4.5 -4.5 -4.6 -4.8 -4.6
-3.4 -3.2 -3.5 -3.2 -3.1 -3.0 -3.0 -3.0 -3.0 -3.1 -3.3 -3.4 -3.6 -3.5 -3.2 -3.2 -3.1 -3.4 -3.7 -3.3 -3.5 -3.4 -3.3 -3.3 -3.4 -3.4 -3.4 -3.3 -3.4 -3.4 -3.4 -3.3 -3.4 -3.5 -3.2 -3.5
-3.1 -2.8 -3.0 -3.1 -2.9 -2.9 -2.9 -2.8 -2.8 -2.7 -2.8 -2.7 -2.9 -3.0 -3.0 -3.2 -2.8 -3.1 -3.0 -2.9 -3.1 -2.9 -3.0 -2.9 -2.9 -2.8 -2.7 -2.6 -2.7 -2.7 -2.9 -2.8 -2.8 -2.8 -2.8 -2.8
-3.9 -3.6 -3.6 -3.8 -3.6 -3.7 -3.7 -3.6 -3.5 -3.3 -3.2 -3.1 -3.3 -3.5 -3.6 -3.7 -3.4 -3.6 -3.2 -3.4 -3.6 -3.5 -3.5 -3.5 -3.5 -3.5 -3.4 -3.4 -3.2 -3.1 -3.2 -3.3 -3.4 -3.6 -3.8 -3.7
-5.4 -5.2 -5.0 -5.0 -4.8 -4.7 -4.8 -4.8 -4.7 -4.5 -4.3 -4.2 -4.3 -4.4 -4.5 -4.3 -4.2 -4.1 -4.0 -4.2 -4.4 -4.4 -4.2 -4.1 -4.1 -4.2 -4.3 -4.5 -4.5 -4.4 -4.5 -4.6 -4.8 -5.1 -5.5 -5.5
-6.3 -6.3 -6.1 -5.9 -5.8 -5.7 -5.5 -5.3 -5.1 -4.9 -4.6 -4.3 -4.1 -3.9 -3.8 -3.6 -3.6 -3.6 -3.6 -3.6 -3.5 -3.4 -3.1 -3.0 -3.2 -3.4 -3.6 -3.8 -4.1 -4.4 -4.6 -4.9 -5.4 -5.7 -6.0 -6.3
-5.1 -5.2 -5.2 -5.1 -4.9 -4.8 -4.6 -4.4 -4.1 -3.8 -3.4 -3.0 -2.8 -2.6 -2.4 -2.2 -2.0 -1.7 -1.5 -1.3 -1.2 -1.1 -.9 -.7 -1.4 -1.4 -1.3 -1.8 -1.9 -2.2 -2.4 -2.8 -3.4 -3.9 -4.4 -4.8
-3.3 -3.5 -3.5 -3.5 -3.5 -3.3 -3.1 -2.9 -2.7 -2.7 -2.6 -2.5 -2.4 -2.2 -2.0 -1.8 -1.7 -1.5 -1.4 -1.2 -1.1 -1.0 -.9 -.9 -.9 -1.1 -1.3 -1.3 -1.4 -1.5 -1.7 -2.0 -2.4 -2.7 -3.0 -3.2

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.1	3.0	2.8	2.7	2.6	2.5	2.4
1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	2.0	2.3	2.5	2.7	2.9	3.0	3.2	3.2	3.2	3.1	3.1	3.2	3.4	3.3	3.2	3.1	3.0	2.7	2.5	2.2	2.0
1.9	1.8	1.9	2.2	2.3	2.4	2.5	2.5	2.4	2.4	2.2	2.0	1.9	2.1	2.3	2.5	2.6	2.7	2.8	2.8	3.0	3.1	3.1	3.0	2.8	2.9	2.8	2.6	2.5	2.7	2.8	2.9	2.7	2.4	2.1	2.8
1.6	1.6	1.8	2.2	2.4	2.4	2.5	2.4	2.2	2.0	1.8	1.9	2.0	2.4	2.3	2.3	2.2	2.2	2.3	2.2	2.4	2.3	2.4	2.3	1.9	2.0	1.9	1.7	1.7	1.7	1.8	1.6	1.6	1.5	1.9	1.5
1.7	1.8	1.9	1.7	1.8	1.9	1.7	1.7	1.6	1.7	1.8	1.9	2.0	2.2	2.1	2.1	2.0	1.7	1.9	1.9	1.8	2.0	1.7	1.8	1.7	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.8
1.8	2.0	1.9	1.8	1.8	1.8	1.8	1.8	2.0	2.2	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.8	2.0	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.7	1.6	1.7	1.8	1.8	1.9	1.7	1.9	1.9	1.9
2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.3	2.1	2.1
2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.1	2.3	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.1
2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.2	2.0	2.2	2.3	2.0	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1
2.2	2.3	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.0	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.1
2.1	2.2	2.0	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.3	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.0
1.9	2.1	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	1.9	2.0	1.8	2.0	2.0	1.9	2.1	1.9	2.1	2.0	1.9	2.0	1.9	1.9	1.9	1.8	2.0	2.0	2.0	2.0	1.9	1.9	1.9
1.5	1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.5	1.7	1.6	1.7	1.8	1.6	1.8	1.7	1.6	1.7	1.6	1.7	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.6	1.5
1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.4	1.4	1.3	1.4	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.6	1.6	1.7	1.6	1.6	1.5	1.4	1.4	1.3	1.3	1.4	1.3
1.3	1.3	1.4	1.3	1.2	1.2	1.1	1.1	1.2	1.3	1.3	1.2	1.2	1.4	1.5	1.6	1.5	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.8	1.6	1.6	1.6	1.5	1.5	1.5	1.4
1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.2	1.4	1.1	1.5	1.7	1.9	2.1	2.2	2.3	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.1	1.9	1.7	1.6	1.5	1.4	1.3	1.3
1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.5	1.6	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.2	2.3	2.3	2.3	2.1	2.1	2.0	1.9	1.7	1.6	1.5	1.3	1.3
1.5	1.5	1.6	1.6	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.7	1.6	1.5	1.5	1.5

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

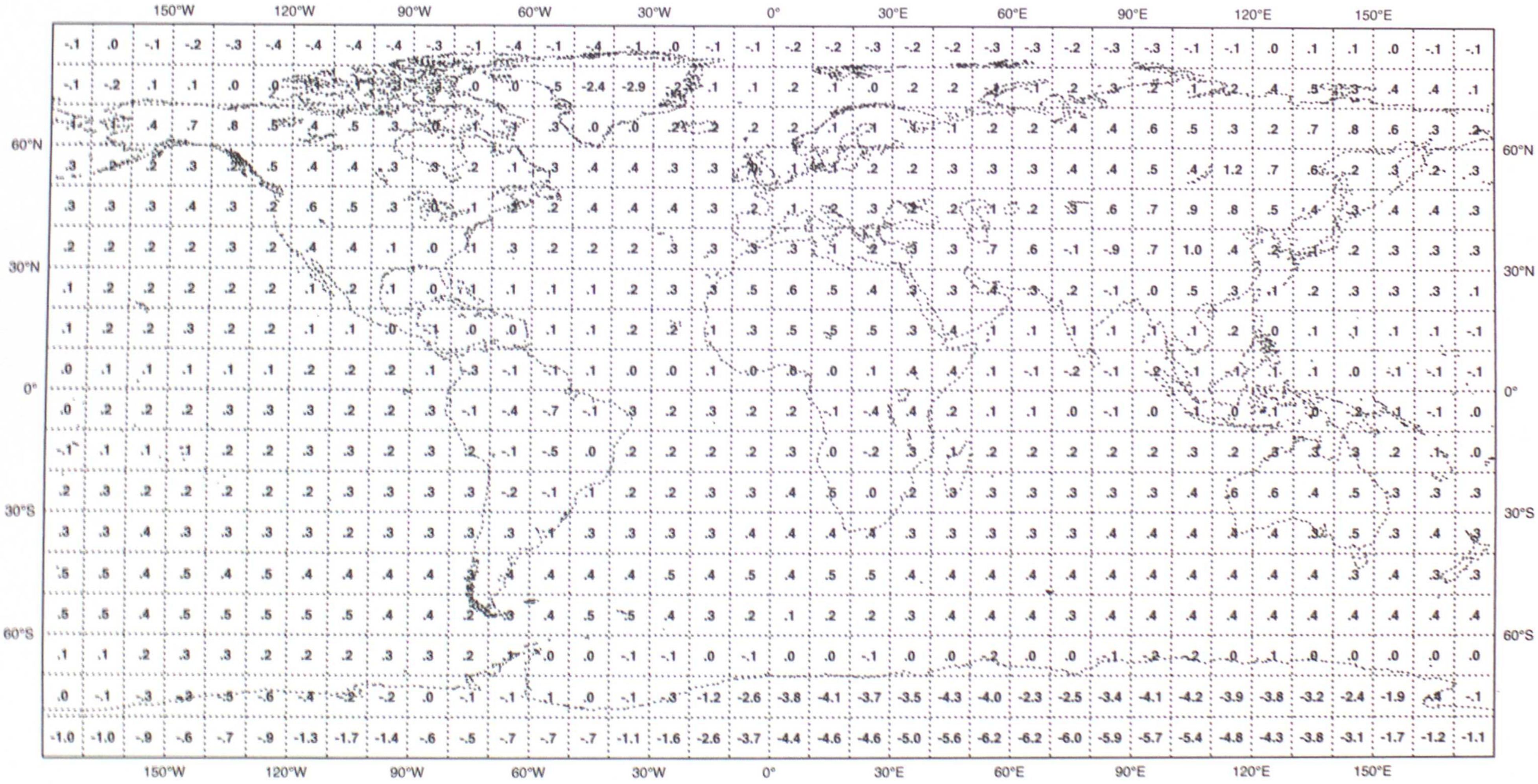

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.1 .0 -.1 -.2 -.3 -.4 -.4 -.4 -.4 -.3 -.1 -.4 -.1 -.4 -.1 .0 -.1 -.1 -.2 -.2 -.3 -.2 -.2 -.3 -.3 -.2 -.3 -.3 -.1 -.1 .0 .1 .1 .0 -.1 -.1
-.1 -.2 .1 .1 .0 .0 .1 .1 .3 .3 .0 .0 .5 -2.4 -2.9 .2 .1 .1 .2 .1 .0 .2 .2 -.1 .1 .2 .3 .2 .1 .2 .4 .5 .3 .4 .4 .1
.1 .1 .4 .7 .8 .5 .4 .5 .3 .0 .1 .1 .3 .0 .0 .2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .4 .4 .6 .5 .3 .2 .7 .8 .6 .3 .2
.3 .2 .2 .3 .2 .5 .4 .4 .3 .3 .2 .1 .3 .4 .4 .3 .3 .0 .1 .1 .2 .2 .3 .3 .3 .4 .4 .5 .4 1.2 .7 .6 .2 .3 .2 .3
.3 .3 .3 .4 .3 .2 .6 .5 .3 .0 .1 .2 .2 .4 .4 .4 .3 .2 .1 .2 .3 .2 .2 .1 .2 .3 .6 .7 .9 .8 .5 .4 .3 .4 .4 .3
.2 .2 .2 .2 .3 .2 .4 .4 .1 .0 .1 .3 .2 .2 .2 .3 .3 .3 .3 .1 .2 .3 .3 .7 .6 -.1 -.9 .7 1.0 .4 .2 .1 .2 .3 .3 .3
.1 .2 .2 .2 .2 .2 .1 .2 .1 .0 .1 .1 .1 .1 .2 .3 .3 .5 .6 .5 .4 .3 .3 .4 .3 .2 -.1 .0 .5 .3 .1 .2 .3 .3 .3 .1
.1 .2 .2 .3 .2 .2 .1 .1 .0 .1 .0 .0 .1 .1 .2 .2 .1 .3 .5 .5 .5 .3 .4 .1 .1 .1 .1 .1 .1 .2 .0 .1 .1 .1 .1 -.1
.0 .1 .1 .1 .1 .1 .2 .2 .2 .1 -.3 -.1 -.1 .1 .0 .0 .1 .0 .0 .0 .1 .4 .4 .1 -.1 -.2 -.1 -.2 .1 -.1 .1 .1 .0 -.1 -.1 -.1
.0 .2 .2 .2 .3 .3 .3 .2 .2 .3 -.1 -.4 -.7 -.1 .3 .2 .3 .2 .2 -.1 -.4 .4 .2 .1 .1 .0 -.1 .0 -.1 .0 .1 .0 -.2 .1 -.1 .0
-.1 .1 .1 .1 .2 .2 .3 .3 .2 .3 .2 -.1 -.5 .0 .2 .2 .2 .2 .3 .0 -.2 .3 .1 .2 .2 .2 .2 .2 .3 .2 .3 .3 .3 .2 .1 .0
.2 .3 .2 .2 .2 .2 .2 .3 .3 .3 .3 -.2 -.1 .1 .2 .2 .3 .3 .4 .5 .0 .2 .3 .3 .3 .3 .3 .3 .4 .6 .6 .4 .5 .3 .3 .3
.3 .3 .4 .3 .3 .3 .3 .2 .3 .3 .3 .3 .1 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .5 .3 .4 .3
.5 .5 .4 .5 .4 .5 .4 .4 .4 .4 .3 .4 .4 .4 .4 .5 .4 .5 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3
.5 .5 .4 .5 .5 .5 .5 .5 .4 .4 .2 .3 .4 .5 .5 .4 .3 .2 .1 .2 .2 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.1 .1 .2 .3 .3 .2 .2 .2 .3 .3 .2 .1 .0 .0 -.1 -.1 .0 -.1 .0 .0 -.1 .0 .0 -.2 .0 .0 -.1 -.2 -.2 .0 .1 .0 .0 .0 .0 .0
.0 -.1 -.3 -.3 -.5 -.6 -.4 -.2 -.2 .0 -.1 -.1 .1 .0 -.1 -.3 -1.2 -2.6 -3.8 -4.1 -3.7 -3.5 -4.3 -4.0 -2.3 -2.5 -3.4 -4.1 -4.2 -3.9 -3.8 -3.2 -2.4 -1.9 -.4 -.1
-1.0 -1.0 -.9 -.6 -.7 -.9 -1.3 -1.7 -1.4 -.6 -.5 -.7 -.7 -.7 -1.1 -1.6 -2.6 -3.7 -4.4 -4.6 -4.6 -5.0 -5.6 -6.2 -6.2 -6.0 -5.9 -5.7 -5.4 -4.8 -4.3 -3.8 -3.1 -1.7 -1.2 -1.1

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

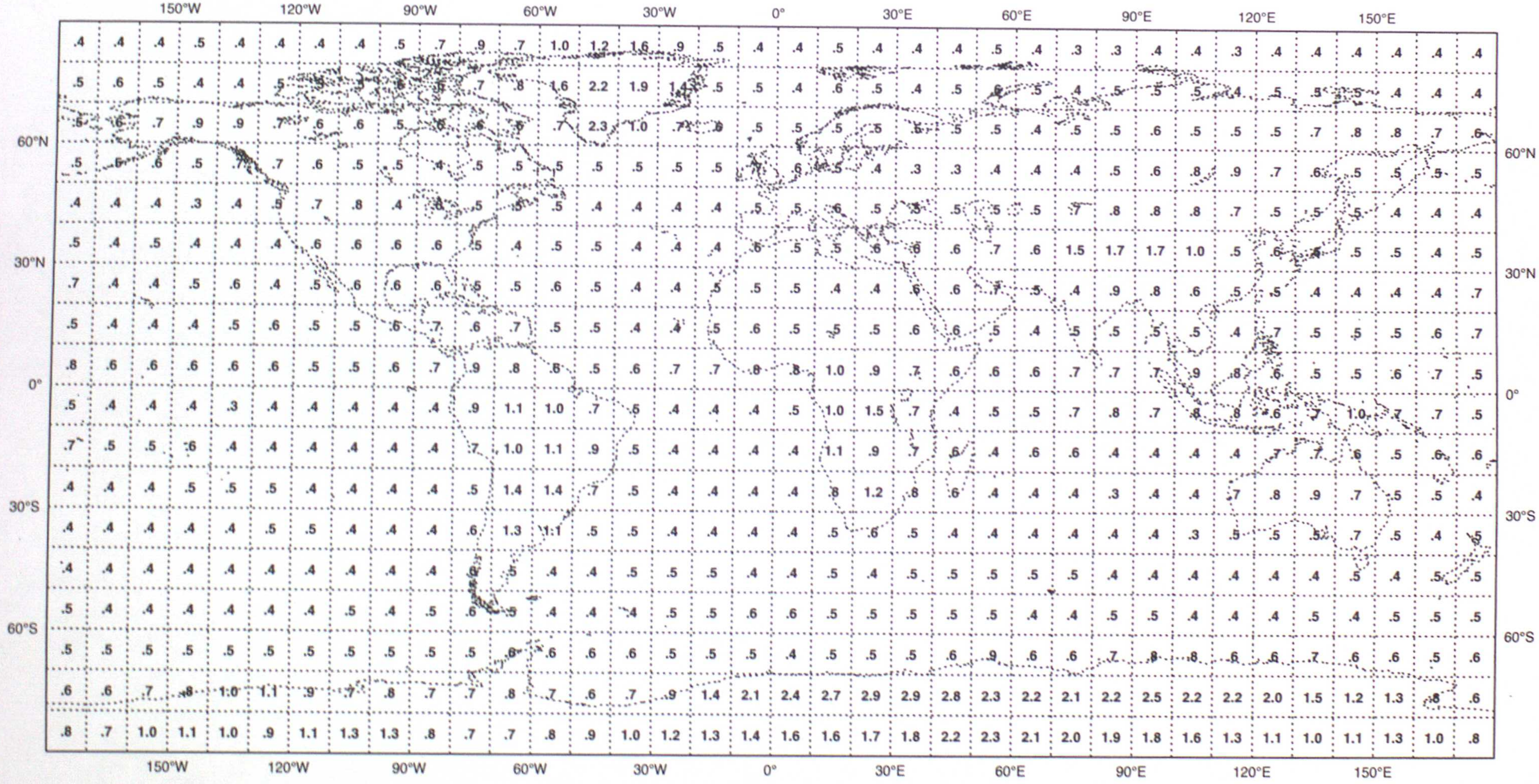

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .5 .4 .4 .4 .4 .5 .7 .9 .7 1.0 1.2 1.6 .9 .5 .4 .4 .5 .4 .4 .4 .5 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4
.5 .6 .5 .4 .4 .5 .5 .5 .6 .5 .7 .8 1.6 2.2 1.9 1.4 .5 .5 .4 .6 .5 .4 .5 .6 .5 .4 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4
.5 .6 .7 .9 .9 .7 .6 .6 .5 .6 .6 .6 .7 2.3 1.0 .7 .6 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .6 .5 .5 .5 .7 .8 .8 .7 .6
.5 .6 .6 .5 .7 .7 .6 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .7 .6 .5 .4 .3 .3 .4 .4 .4 .5 .6 .8 .9 .7 .6 .5 .5 .5 .5
.4 .4 .4 .3 .4 .5 .7 .8 .4 .6 .5 .5 .5 .4 .4 .4 .4 .5 .5 .6 .5 .5 .5 .5 .5 .7 .8 .8 .8 .7 .5 .5 .5 .4 .4 .4
.5 .4 .5 .4 .4 .4 .6 .6 .6 .6 .5 .4 .5 .5 .4 .4 .4 .6 .5 .5 .6 .6 .6 .7 .6 1.5 1.7 1.7 1.0 .5 .6 .6 .5 .5 .4 .5
.7 .4 .4 .5 .6 .4 .5 .6 .6 .6 .5 .5 .6 .5 .4 .4 .5 .5 .5 .4 .4 .6 .6 .7 .5 .4 .9 .8 .6 .5 .5 .4 .4 .4 .4 .7
.5 .4 .4 .4 .5 .6 .5 .5 .6 .7 .6 .7 .5 .5 .4 .4 .5 .6 .5 .5 .5 .6 .6 .5 .4 .5 .5 .5 .5 .4 .7 .5 .5 .5 .6 .7
.8 .6 .6 .6 .6 .6 .5 .5 .6 .7 .9 .8 .6 .5 .6 .7 .7 .8 .8 1.0 .9 .7 .6 .6 .6 .7 .7 .7 .9 .8 .6 .5 .5 .6 .7 .5
.5 .4 .4 .4 .3 .4 .4 .4 .4 .4 .9 1.1 1.0 .7 .5 .4 .4 .4 .5 1.0 1.5 .7 .4 .5 .5 .7 .8 .7 .8 .8 .6 .7 1.0 .7 .7 .5
.7 .5 .5 .6 .4 .4 .4 .4 .4 .4 .7 1.0 1.1 .9 .5 .4 .4 .4 .4 1.1 .9 .7 .6 .4 .6 .6 .4 .4 .4 .4 .7 .7 .6 .5 .6 .6
.4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .5 1.4 1.4 .7 .5 .4 .4 .4 .4 .8 1.2 .8 .6 .4 .4 .4 .3 .4 .4 .7 .8 .9 .7 .5 .5 .4
.4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .6 1.3 1.1 .5 .5 .4 .4 .4 .4 .5 .6 .5 .4 .4 .4 .4 .4 .4 .3 .5 .5 .5 .7 .5 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .5 .5 .5 .4 .4 .5 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5
.5 .4 .4 .4 .4 .4 .4 .5 .4 .5 .6 .5 .4 .4 .4 .5 .5 .6 .6 .5 .5 .5 .5 .5 .4 .4 .5 .5 .4 .4 .4 .5 .4 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .5 .5 .5 .4 .5 .5 .5 .6 .9 .6 .6 .7 .8 .8 .6 .6 .7 .6 .6 .5 .6
.6 .6 .7 .8 1.0 1.1 .9 .7 .8 .7 .7 .8 .7 .6 .7 .9 1.4 2.1 2.4 2.7 2.9 2.9 2.8 2.3 2.2 2.1 2.2 2.5 2.2 2.2 2.0 1.5 1.2 1.3 .8 .6
.8 .7 1.0 1.1 1.0 .9 1.1 1.3 1.3 .8 .7 .7 .8 .9 1.0 1.2 1.3 1.4 1.6 1.6 1.7 1.8 2.2 2.3 2.1 2.0 1.9 1.8 1.6 1.3 1.1 1.0 1.1 1.3 1.0 .8

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

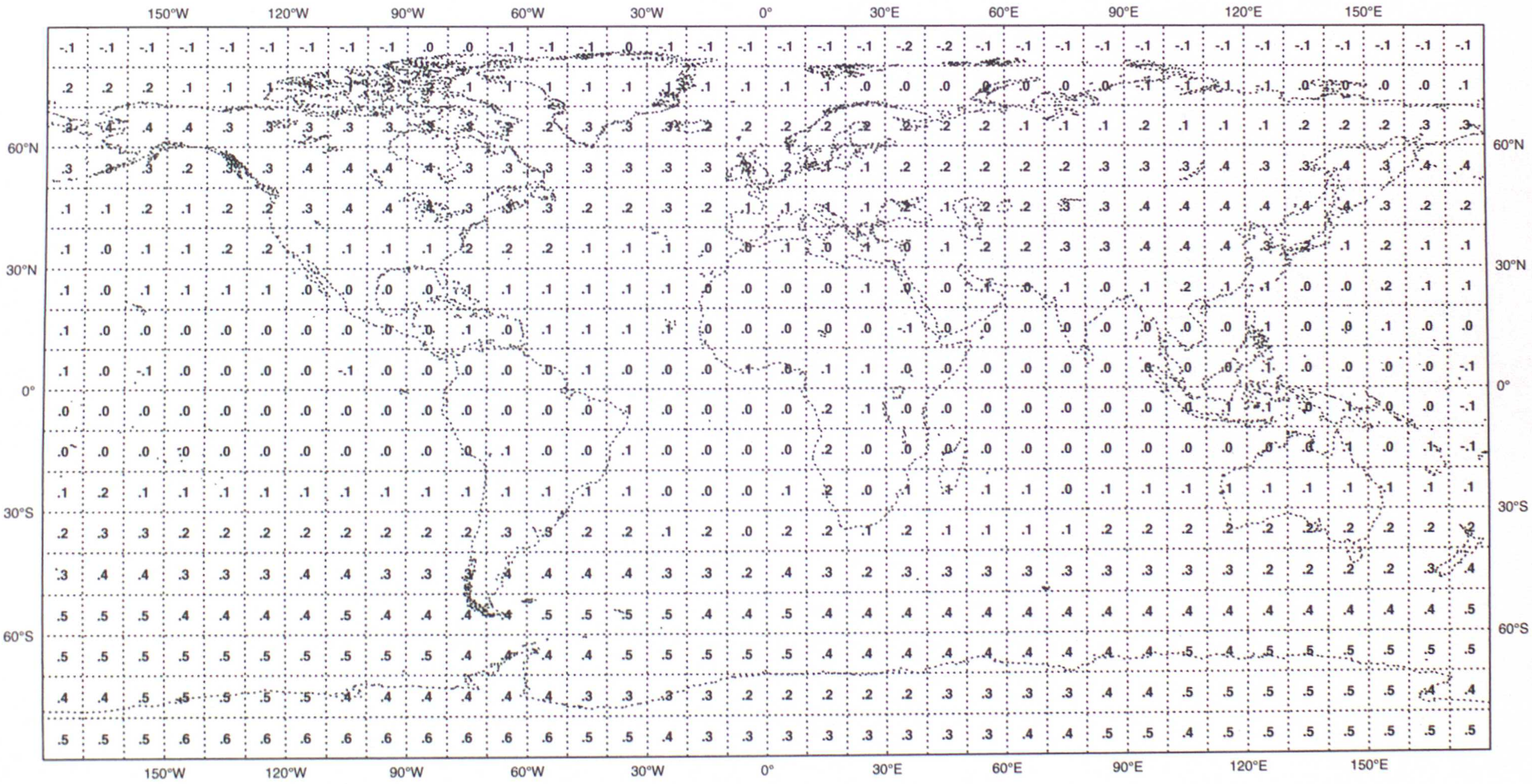

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1
.2 .2 .2 .1 .1 .1 .1 .1 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 -.1 -.1 .1 -.1 .0 .0 .0 .0 .1
.3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .2 .1 .1 .1 .2 .2 .2 .3 .3
.3 .3 .3 .2 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .2 .2 .1 .1 .2 .2 .2 .2 .2 .3 .3 .3 .4 .3 .3 .4 .3 .4 .4
.1 .1 .2 .1 .2 .2 .3 .4 .4 .4 .3 .3 .3 .2 .2 .3 .2 .1 .1 .1 .1 .2 .1 .2 .2 .3 .3 .4 .4 .4 .4 .4 .4 .3 .2 .2
.1 .0 .1 .1 .2 .2 .1 .1 .1 .1 .2 .2 .2 .1 .1 .1 .0 .0 .1 .0 .1 .0 .1 .2 .2 .3 .3 .4 .4 .4 .3 .2 .1 .2 .1 .1
.1 .0 .1 .1 .1 .1 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .0 .0 .1 .0 .1 .0 .1 .2 .1 .1 .0 .0 .2 .1 .1
.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 .1 .1 .1 .0 .0 .0 .0 .0 -.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .1 .0 .0
.1 .0 -.1 .0 .0 .0 .0 -.1 .0 .0 .0 .0 .0 .1 .0 .0 .0 .1 .0 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 .0 -.1
.0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 .0 .2 .1 .0 .0 .0 .0 .0 .0 .0 .0 .1 .1 .0 .1 .0 .0 -.1
.0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .1 .0 .0 .0 .0 .2 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 -.1
.1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .1 .2 .0 .1 .1 .1 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1
.2 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .2 .2 .1 .2 .0 .2 .2 .1 .2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .4 .4 .3 .3 .3 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .2 .4 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .3 .4
.5 .5 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5 .5 .5 .5 .5
.4 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .3 .3 .3 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4
.5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

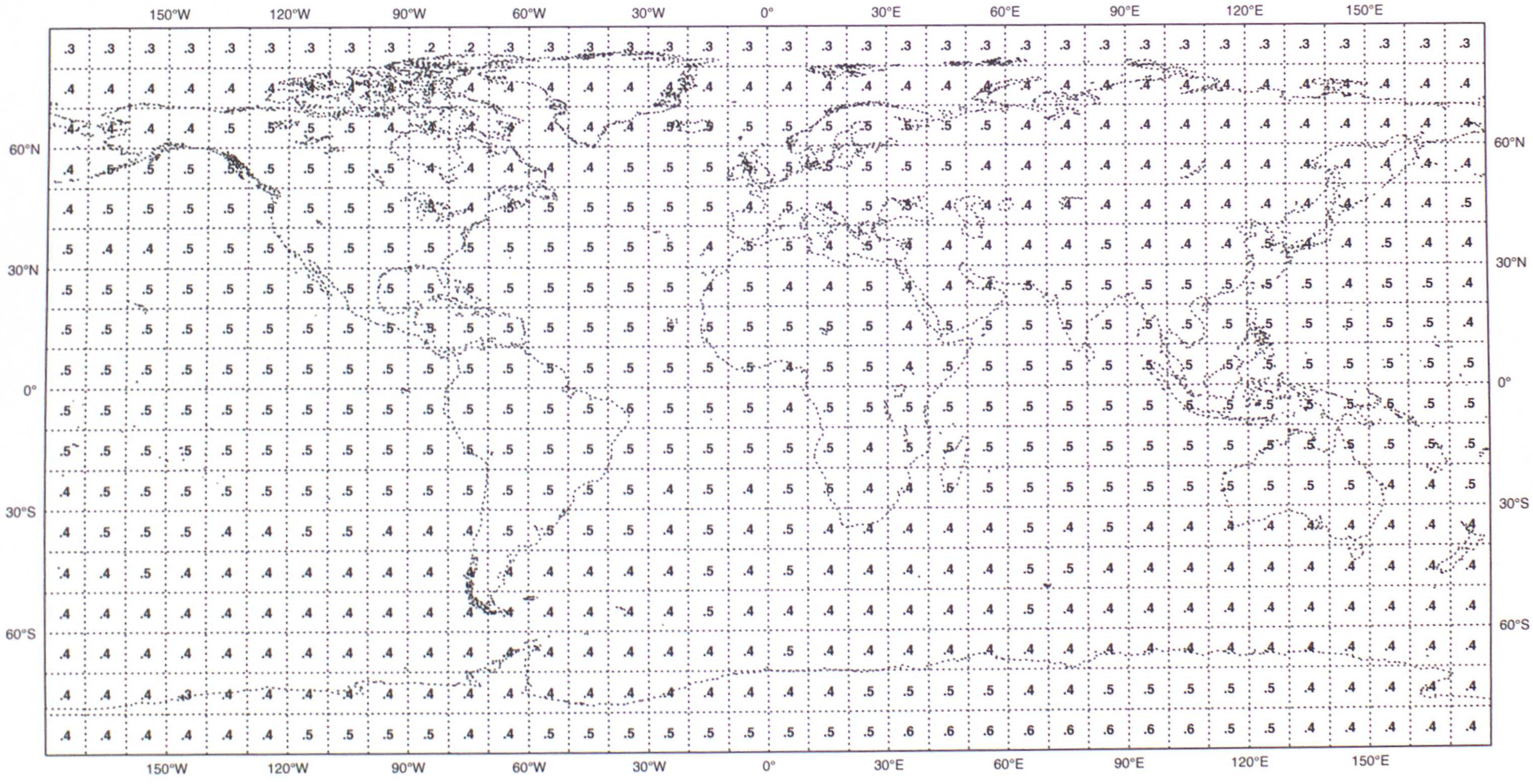

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

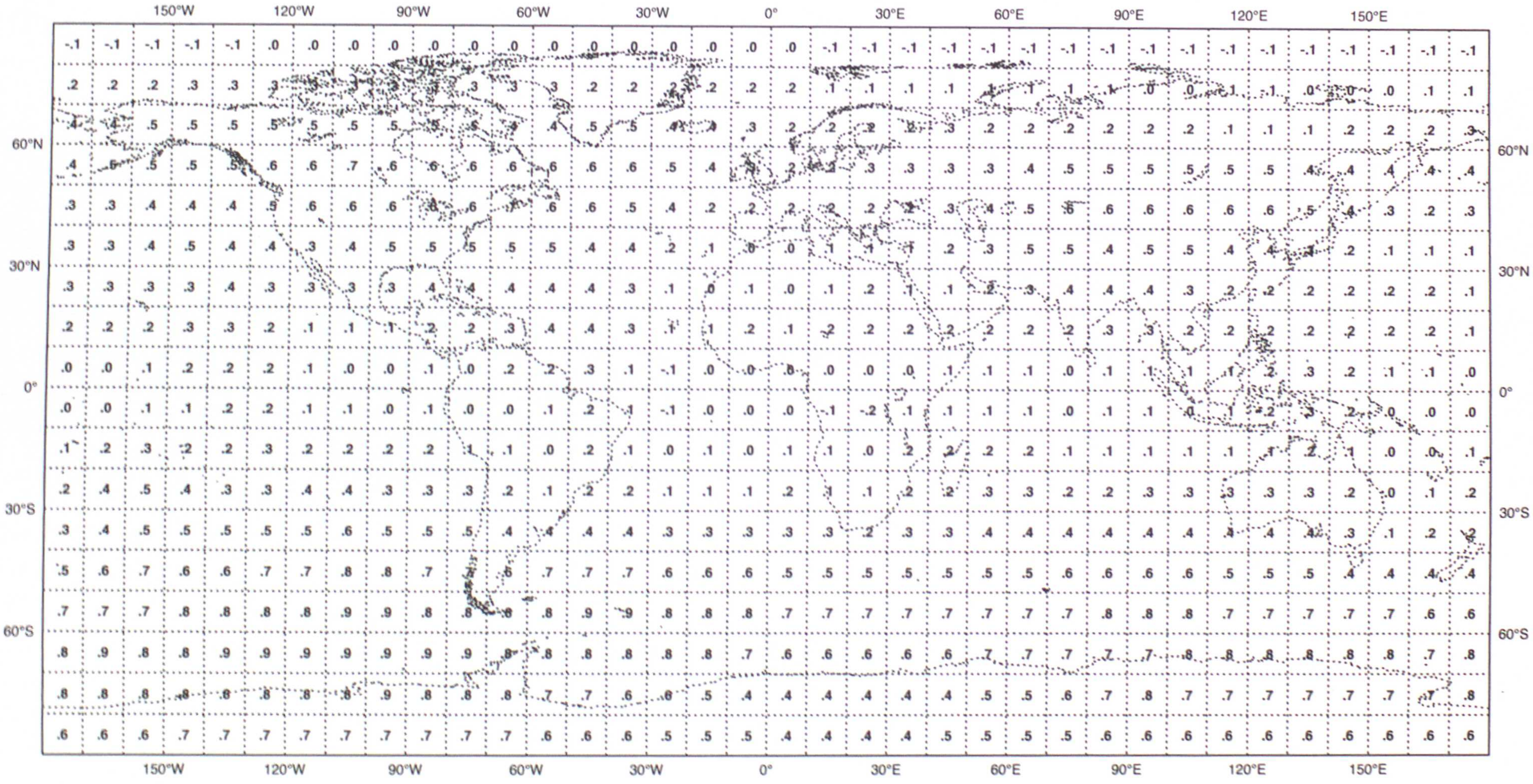

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

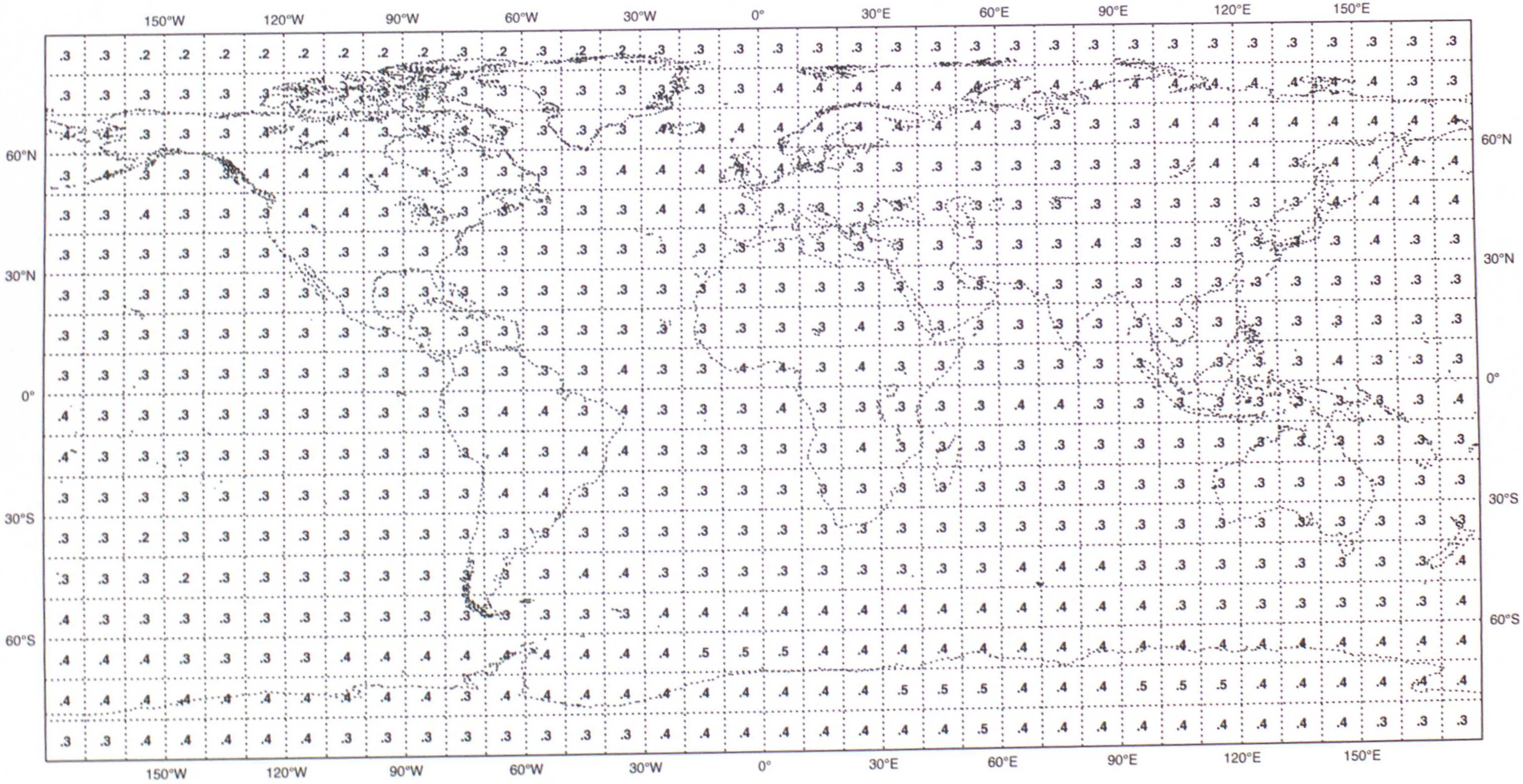
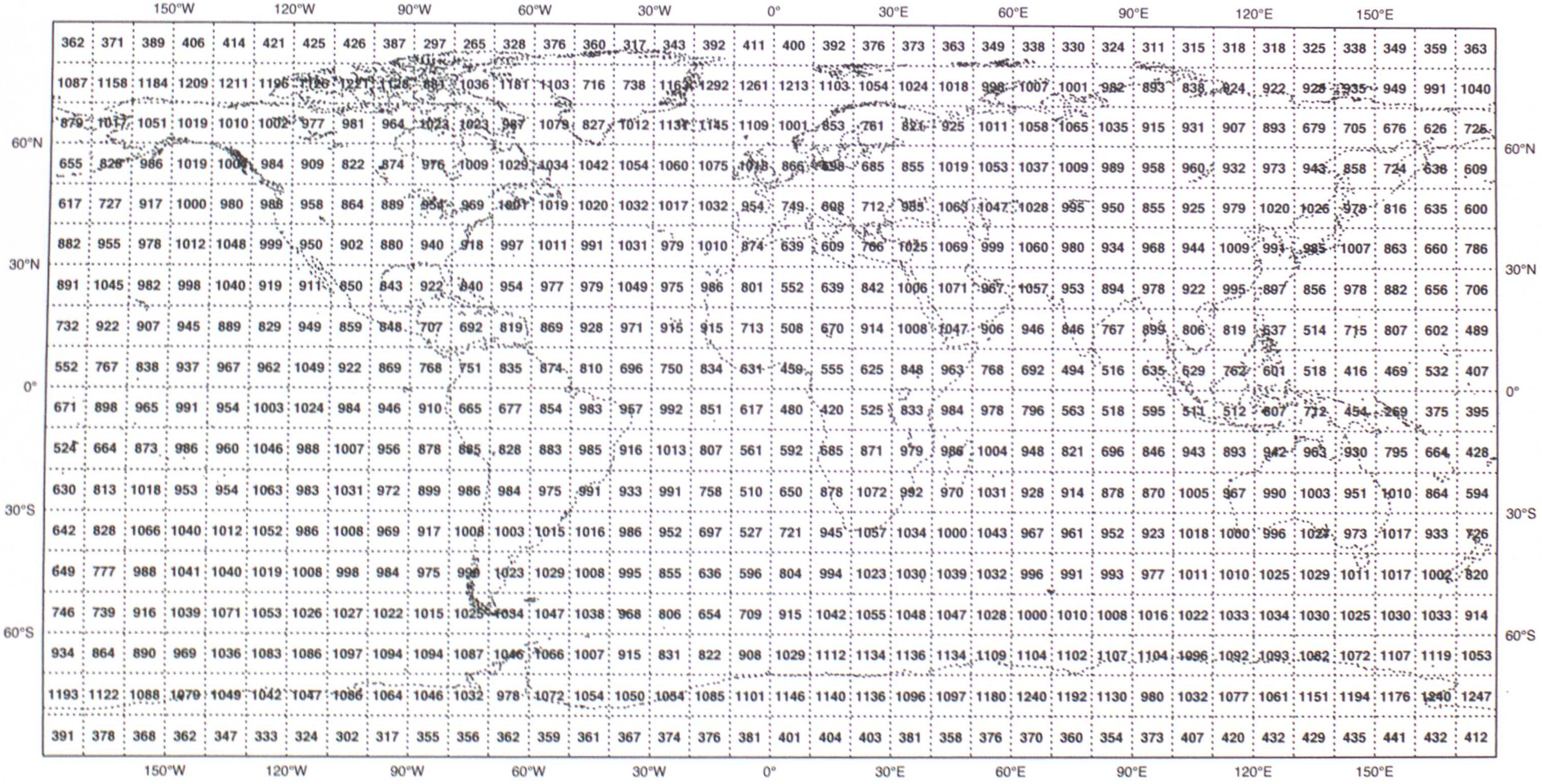

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .3 .2 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .4 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4
.3 .4 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .4 .4
.3 .3 .4 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4
.4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4
.3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

Figure 40. ATOVS mean daily count. NOVEMBER 2003
NOAA16, using all observations
Global average number of observations in 24 hours = 557067



362	371	389	406	414	421	425	426	387	297	265	328	376	360	317	343	392	411	400	392	376	373	363	349	338	330	324	311	315	318	318	325	338	349	359	363
1087	1158	1184	1209	1211	1196	1126	1221	1126	881	1036	1181	1103	716	738	1163	1292	1261	1213	1103	1054	1024	1018	998	1007	1001	982	893	838	824	922	928	935	949	991	1040
879	1017	1051	1019	1010	1002	977	981	964	1023	1023	987	1079	827	1012	1131	1145	1109	1001	853	761	821	925	1011	1058	1065	1035	915	931	907	893	679	705	676	626	725
655	828	986	1019	1008	984	909	822	874	976	1009	1029	1034	1042	1054	1060	1075	1018	866	898	685	855	1019	1053	1037	1009	989	958	960	932	973	943	858	724	638	609
617	727	917	1000	980	988	958	864	889	954	969	1001	1019	1020	1032	1017	1032	954	749	608	712	985	1063	1047	1028	995	950	855	925	979	1020	1026	978	816	635	600
882	955	978	1012	1048	999	950	902	880	940	918	997	1011	991	1031	979	1010	874	639	609	766	1025	1069	999	1060	980	934	968	944	1009	991	985	1007	863	660	786
891	1045	982	998	1040	919	911	850	843	922	840	954	977	979	1049	975	986	801	552	639	842	1006	1071	967	1057	953	894	978	922	995	897	856	978	882	656	706
732	922	907	945	889	829	949	859	848	707	692	819	869	928	971	915	915	713	508	670	914	1008	1047	906	946	846	767	899	806	819	637	514	715	807	602	489
552	767	838	937	967	962	1049	922	869	768	751	835	874	810	696	750	834	631	459	555	625	848	963	768	692	494	516	635	629	762	601	518	416	469	532	407
671	898	965	991	954	1003	1024	984	946	910	665	677	854	983	957	992	851	617	480	420	525	833	984	978	796	563	518	595	511	512	607	712	454	269	375	395
524	664	873	986	960	1046	988	1007	956	878	885	828	883	985	916	1013	807	561	592	685	871	979	986	1004	948	821	696	846	943	893	942	963	930	795	664	428
630	813	1018	953	954	1063	983	1031	972	899	986	984	975	991	933	991	758	510	650	878	1072	992	970	1031	928	914	878	870	1005	967	990	1003	951	1010	864	594
642	828	1066	1040	1012	1052	986	1008	969	917	1008	1003	1015	1016	986	952	697	527	721	945	1057	1034	1000	1043	967	961	952	923	1018	1000	996	1027	973	1017	933	726
649	777	988	1041	1040	1019	1008	998	984	975	999	1023	1029	1008	995	855	636	596	804	994	1023	1030	1039	1032	996	991	993	977	1011	1010	1025	1029	1011	1017	1002	820
746	739	916	1039	1071	1053	1026	1027	1022	1015	1025	1034	1047	1038	968	806	654	709	915	1042	1055	1048	1047	1028	1000	1010	1008	1016	1022	1033	1034	1030	1025	1030	1033	914
934	864	890	969	1036	1083	1086	1097	1094	1094	1087	1046	1066	1007	915	831	822	908	1029	1112	1134	1136	1134	1109	1104	1102	1107	1104	1096	1092	1093	1082	1072	1107	1119	1053
1193	1122	1088	1079	1049	1042	1047	1086	1064	1046	1032	978	1072	1054	1050	1054	1085	1101	1146	1140	1136	1096	1097	1180	1240	1192	1130	980	1032	1077	1061	1151	1194	1176	1240	1247
391	378	368	362	347	333	324	302	317	355	356	362	359	361	367	374	376	381	401	404	403	381	358	376	370	360	354	373	407	420	432	429	435	441	432	412

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations

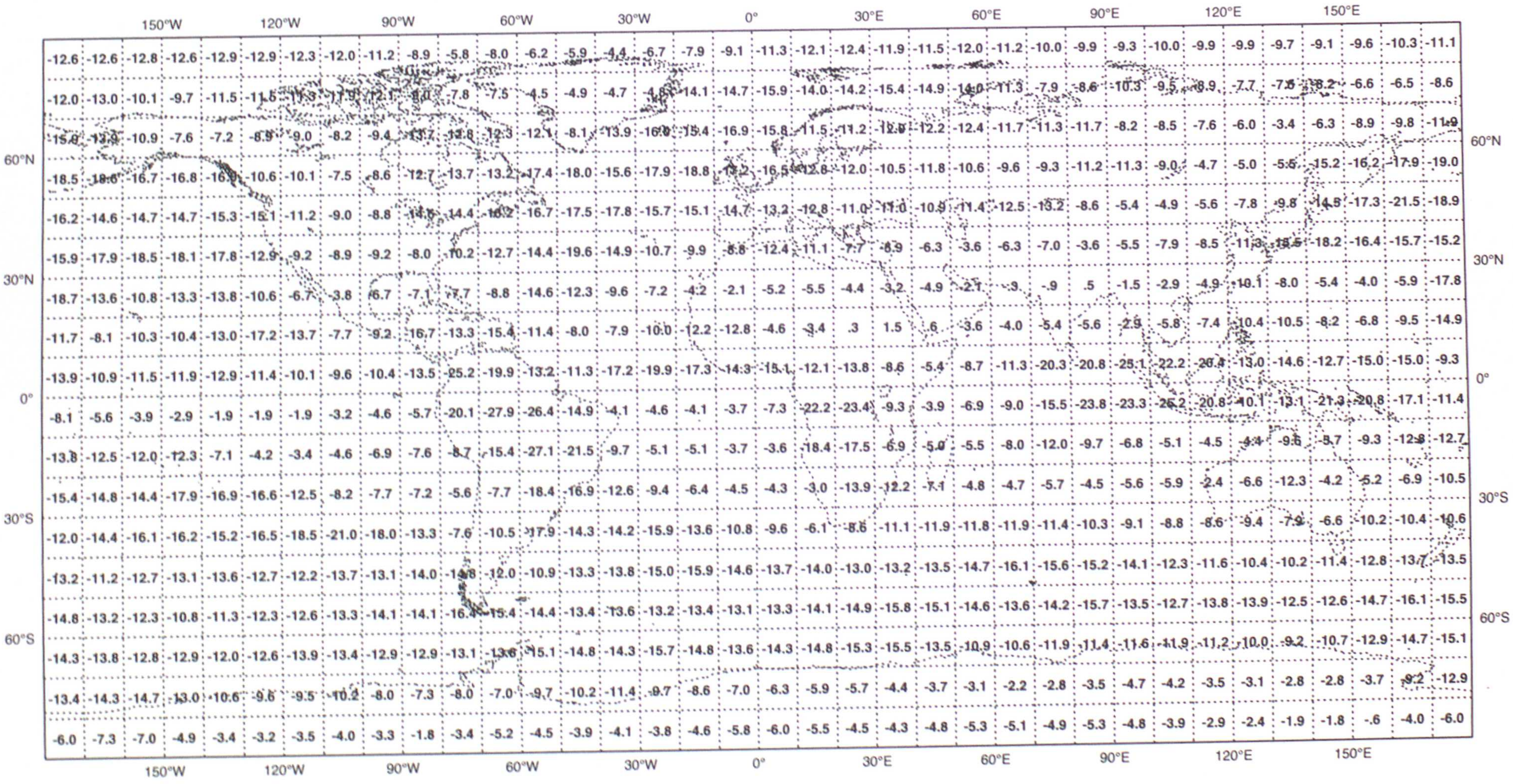
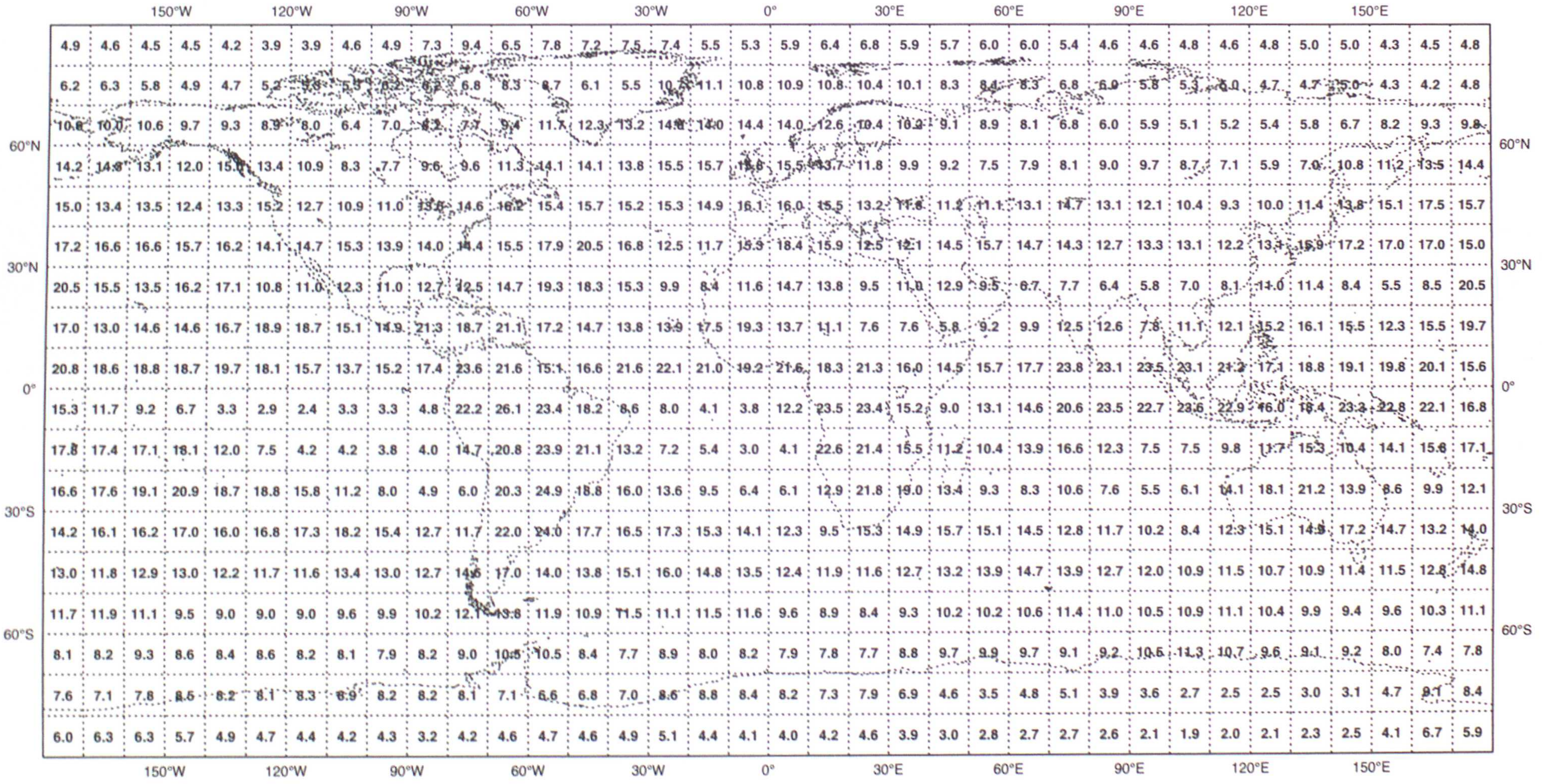
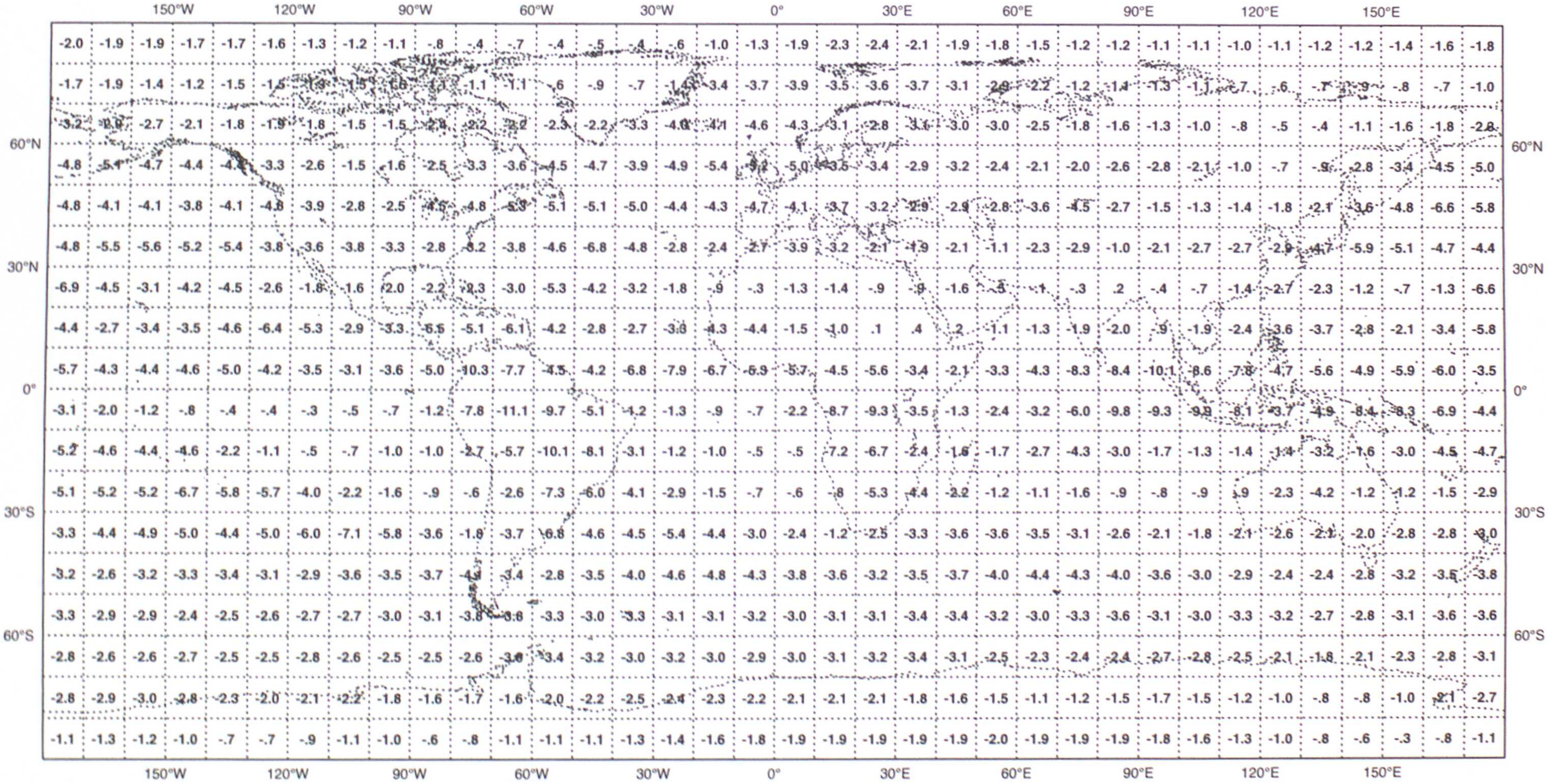

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-12.6 -12.6 -12.8 -12.6 -12.9 -12.9 -12.3 -12.0 -11.2 -8.9 -5.8 -8.0 -6.2 -5.9 -4.4 -6.7 -7.9 -9.1 -11.3 -12.1 -12.4 -11.9 -11.5 -12.0 -11.2 -10.0 -9.9 -9.3 -10.0 -9.9 -9.9 -9.7 -9.1 -9.6 -10.3 -11.1
-12.0 -13.0 -10.1 -9.7 -11.5 -11.5 -11.3 -11.9 -12.1 -8.0 -7.8 -7.5 -4.5 -4.9 -4.7 -4.8 -14.1 -14.7 -15.9 -14.0 -14.2 -15.4 -14.9 -14.0 -11.3 -7.9 -8.6 -10.3 -9.5 -8.9 -7.7 -7.6 -8.2 -6.6 -6.5 -8.6
-15.0 -13.9 -10.9 -7.6 -7.2 -8.9 -9.0 -8.2 -9.4 -13.7 -12.8 -12.3 -12.1 -8.1 -13.9 -16.0 -15.4 -16.9 -15.8 -11.5 -11.2 -12.0 -12.2 -12.4 -11.7 -11.3 -11.7 -8.2 -8.5 -7.6 -6.0 -3.4 -6.3 -8.9 -9.8 -11.9
-18.5 -18.6 -16.7 -16.8 -16.9 -10.6 -10.1 -7.5 -8.6 -12.7 -13.7 -13.2 -17.4 -18.0 -15.6 -17.9 -18.8 -13.2 -16.5 -12.8 -12.0 -10.5 -11.8 -10.6 -9.6 -9.3 -11.2 -11.3 -9.0 -4.7 -5.0 -5.5 -15.2 -16.2 -17.9 -19.0
-16.2 -14.6 -14.7 -14.7 -15.3 -15.1 -11.2 -9.0 -8.8 -14.5 -14.4 -16.2 -16.7 -17.5 -17.8 -15.7 -15.1 -14.7 -13.2 -12.8 -11.0 -11.0 -10.9 -11.4 -12.5 -13.2 -8.6 -5.4 -4.9 -5.6 -7.8 -9.8 -14.5 -17.3 -21.5 -18.9
-15.9 -17.9 -18.5 -18.1 -17.8 -12.9 -9.2 -8.9 -9.2 -8.0 -10.2 -12.7 -14.4 -19.6 -14.9 -10.7 -9.9 -8.8 -12.4 -11.1 -7.7 -8.9 -6.3 -3.6 -6.3 -7.0 -3.6 -5.5 -7.9 -8.5 -11.3 -15.5 -18.2 -16.4 -15.7 -15.2
-18.7 -13.6 -10.8 -13.3 -13.8 -10.6 -6.7 -3.8 -6.7 -7.1 -7.7 -8.8 -14.6 -12.3 -9.6 -7.2 -4.2 -2.1 -5.2 -5.5 -4.4 -3.2 -4.9 -2.1 -.9 -.9 .5 -1.5 -2.9 -4.9 -10.1 -8.0 -5.4 -4.0 -5.9 -17.8
-11.7 -8.1 -10.3 -10.4 -13.0 -17.2 -13.7 -7.7 -9.2 -16.7 -13.3 -15.4 -11.4 -8.0 -7.9 -10.0 -12.2 -12.8 -4.6 -3.4 .3 1.5 .6 -3.6 -4.0 -5.4 -5.6 -2.9 -5.8 -7.4 -10.4 -10.5 -8.2 -6.8 -9.5 -14.9
-13.9 -10.9 -11.5 -11.9 -12.9 -11.4 -10.1 -9.6 -10.4 -13.5 -25.2 -19.9 -13.2 -11.3 -17.2 -19.9 -17.3 -14.3 -15.1 -12.1 -13.8 -8.6 -5.4 -8.7 -11.3 -20.3 -20.8 -25.1 -22.2 -20.4 -13.0 -14.6 -12.7 -15.0 -15.0 -9.3
-8.1 -5.6 -3.9 -2.9 -1.9 -1.9 -1.9 -3.2 -4.6 -5.7 -20.1 -27.9 -26.4 -14.9 -4.1 -4.6 -4.1 -3.7 -7.3 -22.2 -23.4 -9.3 -3.9 -6.9 -9.0 -15.5 -23.8 -23.3 -26.2 -20.8 -10.1 -13.1 -21.3 -20.8 -17.1 -11.4
-13.8 -12.5 -12.0 -12.3 -7.1 -4.2 -3.4 -4.6 -6.9 -7.6 -8.7 -15.4 -27.1 -21.5 -9.7 -5.1 -5.1 -3.7 -3.6 -18.4 -17.5 -6.9 -5.0 -5.5 -8.0 -12.0 -9.7 -6.8 -5.1 -4.5 -4.4 -9.6 -5.7 -9.3 -12.8 -12.7
-15.4 -14.8 -14.4 -17.9 -16.9 -16.6 -12.5 -8.2 -7.7 -7.2 -5.6 -7.7 -18.4 -16.9 -12.6 -9.4 -6.4 -4.5 -4.3 -3.0 -13.9 -12.2 -7.1 -4.8 -4.7 -5.7 -4.5 -5.6 -5.9 -2.4 -6.6 -12.3 -4.2 -5.2 -6.9 -10.5
-12.0 -14.4 -16.1 -16.2 -15.2 -16.5 -18.5 -21.0 -18.0 -13.3 -7.6 -10.5 -17.9 -14.3 -14.2 -15.9 -13.6 -10.8 -9.6 -6.1 -8.6 -11.1 -11.9 -11.8 -11.9 -11.4 -10.3 -9.1 -8.8 -8.6 -9.4 -7.9 -6.6 -10.2 -10.4 -10.6
-13.2 -11.2 -12.7 -13.1 -13.6 -12.7 -12.2 -13.7 -13.1 -14.0 -14.8 -12.0 -10.9 -13.3 -13.8 -15.0 -15.9 -14.6 -13.7 -14.0 -13.0 -13.2 -13.5 -14.7 -16.1 -15.6 -15.2 -14.1 -12.3 -11.6 -10.4 -10.2 -11.4 -12.8 -13.7 -13.5
-14.8 -13.2 -12.3 -10.8 -11.3 -12.3 -12.6 -13.3 -14.1 -14.1 -16.4 -15.4 -14.4 -13.4 -13.6 -13.2 -13.4 -13.1 -13.3 -14.1 -14.9 -15.8 -15.1 -14.6 -13.6 -14.2 -15.7 -13.5 -12.7 -13.8 -13.9 -12.5 -12.6 -14.7 -16.1 -15.5
-14.3 -13.8 -12.8 -12.9 -12.0 -12.6 -13.9 -13.4 -12.9 -12.9 -13.1 -13.6 -15.1 -14.8 -14.3 -15.7 -14.8 -13.6 -14.3 -14.8 -15.3 -15.5 -13.5 -10.9 -10.6 -11.9 -11.4 -11.6 -11.9 -11.2 -10.0 -9.2 -10.7 -12.9 -14.7 -15.1
-13.4 -14.3 -14.7 -13.0 -10.6 -9.6 -9.5 -10.2 -8.0 -7.3 -8.0 -7.0 -9.7 -10.2 -11.4 -9.7 -8.6 -7.0 -6.3 -5.9 -5.7 -4.4 -3.7 -3.1 -2.2 -2.8 -3.5 -4.7 -4.2 -3.5 -3.1 -2.8 -2.8 -3.7 -9.2 -12.9
-6.0 -7.3 -7.0 -4.9 -3.4 -3.2 -3.5 -4.0 -3.3 -1.8 -3.4 -5.2 -4.5 -3.9 -4.1 -3.8 -4.6 -5.8 -6.0 -5.5 -4.5 -4.3 -4.8 -5.3 -5.1 -4.9 -5.3 -4.8 -3.9 -2.9 -2.4 -1.9 -1.8 -.6 -4.0 -6.0
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations



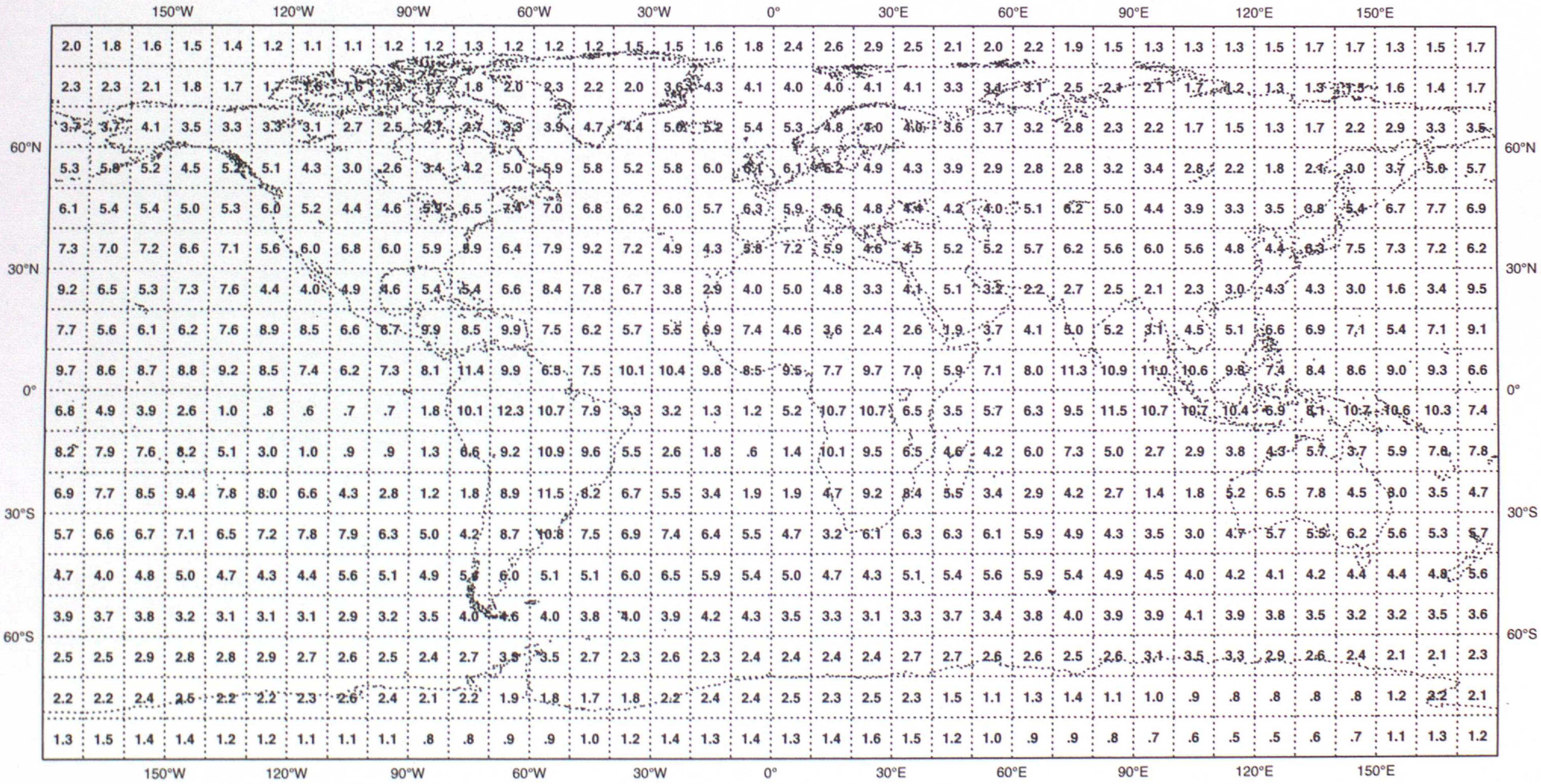
4.9	4.6	4.5	4.5	4.2	3.9	3.9	4.6	4.9	7.3	9.4	6.5	7.8	7.2	7.5	7.4	5.5	5.3	5.9	6.4	6.8	5.9	5.7	6.0	6.0	5.4	4.6	4.6	4.8	4.6	4.8	5.0	5.0	4.3	4.5	4.8
6.2	6.3	5.8	4.9	4.7	5.2	5.8	5.3	6.2	6.2	6.8	8.3	8.7	6.1	5.5	10.7	11.1	10.8	10.9	10.8	10.4	10.1	8.3	8.4	8.3	6.8	6.9	5.8	5.3	6.0	4.7	4.7	5.0	4.3	4.2	4.8
10.6	10.0	10.6	9.7	9.3	8.9	8.0	6.4	7.0	8.2	7.7	9.4	11.7	12.3	13.2	14.8	14.0	14.4	14.0	12.6	10.4	10.2	9.1	8.9	8.1	6.8	6.0	5.9	5.1	5.2	5.4	5.8	6.7	8.2	9.3	9.8
14.2	14.8	13.1	12.0	15.0	13.4	10.9	8.3	7.7	9.6	9.6	11.3	14.1	14.1	13.8	15.5	15.7	15.6	15.5	13.7	11.8	9.9	9.2	7.5	7.9	8.1	9.0	9.7	8.7	7.1	5.9	7.0	10.8	11.2	13.5	14.4
15.0	13.4	13.5	12.4	13.3	15.2	12.7	10.9	11.0	13.6	14.6	16.2	15.4	15.7	15.2	15.3	14.9	16.1	16.0	15.5	13.2	11.6	11.2	11.1	13.1	14.7	13.1	12.1	10.4	9.3	10.0	11.4	13.8	15.1	17.5	15.7
17.2	16.6	16.6	15.7	16.2	14.1	14.7	15.3	13.9	14.0	14.4	15.5	17.9	20.5	16.8	12.5	11.7	15.9	18.4	15.9	12.5	12.1	14.5	15.7	14.7	14.3	12.7	13.3	13.1	12.2	13.1	15.9	17.2	17.0	17.0	15.0
20.5	15.5	13.5	16.2	17.1	10.8	11.0	12.3	11.0	12.7	12.5	14.7	19.3	18.3	15.3	9.9	8.4	11.6	14.7	13.8	9.5	11.0	12.9	9.5	6.7	7.7	6.4	5.8	7.0	8.1	11.0	11.4	8.4	5.5	8.5	20.5
17.0	13.0	14.6	14.6	16.7	18.9	18.7	15.1	14.9	21.3	18.7	21.1	17.2	14.7	13.8	13.9	17.5	19.3	13.7	11.1	7.6	7.6	5.8	9.2	9.9	12.5	12.6	7.8	11.1	12.1	15.2	16.1	15.5	12.3	15.5	19.7
20.8	18.6	18.8	18.7	19.7	18.1	15.7	13.7	15.2	17.4	23.6	21.6	15.1	16.6	21.6	22.1	21.0	19.2	21.6	18.3	21.3	16.0	14.5	15.7	17.7	23.8	23.1	23.5	23.1	21.2	17.1	18.8	19.1	19.8	20.1	15.6
15.3	11.7	9.2	6.7	3.3	2.9	2.4	3.3	3.3	4.8	22.2	26.1	23.4	18.2	8.6	8.0	4.1	3.8	12.2	23.5	23.4	15.2	9.0	13.1	14.6	20.6	23.5	22.7	23.6	22.9	16.0	18.4	23.3	22.8	22.1	16.8
17.8	17.4	17.1	18.1	12.0	7.5	4.2	4.2	3.8	4.0	14.7	20.8	23.9	21.1	13.2	7.2	5.4	3.0	4.1	22.6	21.4	15.5	11.2	10.4	13.9	16.6	12.3	7.5	7.5	9.8	11.7	15.3	10.4	14.1	15.6	17.1
16.6	17.6	19.1	20.9	18.7	18.8	15.8	11.2	8.0	4.9	6.0	20.3	24.9	18.8	16.0	13.6	9.5	6.4	6.1	12.9	21.8	19.0	13.4	9.3	8.3	10.6	7.6	5.5	6.1	14.1	18.1	21.2	13.9	8.6	9.9	12.1
14.2	16.1	16.2	17.0	16.0	16.8	17.3	18.2	15.4	12.7	11.7	22.0	24.0	17.7	16.5	17.3	15.3	14.1	12.3	9.5	15.3	14.9	15.7	15.1	14.5	12.8	11.7	10.2	8.4	12.3	15.1	14.9	17.2	14.7	13.2	14.0
13.0	11.8	12.9	13.0	12.2	11.7	11.6	13.4	13.0	12.7	14.6	17.0	14.0	13.8	15.1	16.0	14.8	13.5	12.4	11.9	11.6	12.7	13.2	13.9	14.7	13.9	12.7	12.0	10.9	11.5	10.7	10.9	11.4	11.5	12.8	14.8
11.7	11.9	11.1	9.5	9.0	9.0	9.0	9.6	9.9	10.2	12.1	13.8	11.9	10.9	11.5	11.1	11.5	11.6	9.6	8.9	8.4	9.3	10.2	10.2	10.6	11.4	11.0	10.5	10.9	11.1	10.4	9.9	9.4	9.6	10.3	11.1
8.1	8.2	9.3	8.6	8.4	8.6	8.2	8.1	7.9	8.2	9.0	10.5	10.5	8.4	7.7	8.9	8.0	8.2	7.9	7.8	7.7	8.8	9.7	9.9	9.7	9.1	9.2	10.6	11.3	10.7	9.6	9.1	9.2	8.0	7.4	7.8
7.6	7.1	7.8	8.5	8.2	8.1	8.3	6.9	8.2	8.2	8.1	7.1	6.6	6.8	7.0	8.6	8.8	8.4	8.2	7.3	7.9	6.9	4.6	3.5	4.8	5.1	3.9	3.6	2.7	2.5	2.5	3.0	3.1	4.7	9.1	8.4
6.0	6.3	6.3	5.7	4.9	4.7	4.4	4.2	4.3	3.2	4.2	4.6	4.7	4.6	4.9	5.1	4.4	4.1	4.0	4.2	4.6	3.9	3.0	2.8	2.7	2.7	2.6	2.1	1.9	2.0	2.1	2.3	2.5	4.1	6.7	5.9

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-2.0	-1.9	-1.9	-1.7	-1.7	-1.6	-1.3	-1.2	-1.1	-.8	-.4	-.7	-.4	-.5	-.4	-.6	-1.0	-1.3	-1.9	-2.3	-2.4	-2.1	-1.9	-1.8	-1.5	-1.2	-1.2	-1.1	-1.1	-1.0	-1.1	-1.2	-1.2	-1.4	-1.6	-1.8
-1.7	-1.9	-1.4	-1.2	-1.5	-1.5	-1.3	-1.5	-1.0	-1.1	-1.1	-1.1	-.6	-.9	-.7	-1.4	-3.4	-3.7	-3.9	-3.5	-3.6	-3.7	-3.1	-2.9	-2.2	-1.2	-1.4	-1.3	-1.1	-.7	-.6	-.7	-.9	-.8	-.7	-1.0
-3.2	-2.9	-2.7	-2.1	-1.8	-1.9	-1.8	-1.5	-1.5	-2.4	-2.2	-2.2	-2.3	-2.2	-3.3	-4.0	-4.1	-4.6	-4.3	-3.1	-2.8	-3.1	-3.0	-3.0	-2.5	-1.8	-1.6	-1.3	-1.0	-.8	-.5	-.4	-1.1	-1.6	-1.8	-2.8
-4.8	-5.4	-4.7	-4.4	-4.4	-3.3	-2.6	-1.5	-1.6	-2.5	-3.3	-3.6	-4.5	-4.7	-3.9	-4.9	-5.4	-5.2	-5.0	-3.5	-3.4	-2.9	-3.2	-2.4	-2.1	-2.0	-2.6	-2.8	-2.1	-1.0	-.7	-.9	-2.8	-3.4	-4.5	-5.0
-4.8	-4.1	-4.1	-3.8	-4.1	-4.8	-3.9	-2.8	-2.5	-4.5	-4.8	-5.3	-5.1	-5.1	-5.0	-4.4	-4.3	-4.7	-4.1	-3.7	-3.2	-2.9	-2.9	-2.8	-3.6	-4.5	-2.7	-1.5	-1.3	-1.4	-1.8	-2.1	-3.6	-4.8	-6.6	-5.8
-4.8	-5.5	-5.6	-5.2	-5.4	-3.8	-3.6	-3.8	-3.3	-2.8	-3.2	-3.8	-4.6	-6.8	-4.8	-2.8	-2.4	-2.7	-3.9	-3.2	-2.1	-1.9	-2.1	-1.1	-2.3	-2.9	-1.0	-2.1	-2.7	-2.7	-2.9	-4.7	-5.9	-5.1	-4.7	-4.4
-6.9	-4.5	-3.1	-4.2	-4.5	-2.6	-1.8	-1.6	-2.0	-2.2	-2.3	-3.0	-5.3	-4.2	-3.2	-1.8	-.9	-.3	-1.3	-1.4	-.9	-.9	-1.6	-.5	-.1	-.3	.2	-.4	-.7	-1.4	-2.7	-2.3	-1.2	-.7	-1.3	-6.6
-4.4	-2.7	-3.4	-3.5	-4.6	-6.4	-5.3	-2.9	-3.3	-6.5	-5.1	-6.1	-4.2	-2.8	-2.7	-3.8	-4.3	-4.4	-1.5	-1.0	.1	.4	.2	-1.1	-1.3	-1.9	-2.0	-.9	-1.9	-2.4	-3.6	-3.7	-2.8	-2.1	-3.4	-5.8
-5.7	-4.3	-4.4	-4.6	-5.0	-4.2	-3.5	-3.1	-3.6	-5.0	-10.3	-7.7	-4.5	-4.2	-6.8	-7.9	-6.7	-6.9	-5.7	-4.5	-5.6	-3.4	-2.1	-3.3	-4.3	-8.3	-8.4	-10.1	-8.6	-7.8	-4.7	-5.6	-4.9	-5.9	-6.0	-3.5
-3.1	-2.0	-1.2	-.8	-.4	-.4	-.3	-.5	-.7	-1.2	-7.8	-11.1	-9.7	-5.1	-1.2	-1.3	-.9	-.7	-2.2	-8.7	-9.3	-3.5	-1.3	-2.4	-3.2	-6.0	-9.8	-9.3	-9.9	-8.1	-3.7	-4.9	-8.4	-8.3	-6.9	-4.4
-5.2	-4.6	-4.4	-4.6	-2.2	-1.1	-.5	-.7	-1.0	-1.0	-2.7	-5.7	-10.1	-8.1	-3.1	-1.2	-1.0	-.5	-.5	-7.2	-6.7	-2.4	-1.6	-1.7	-2.7	-4.3	-3.0	-1.7	-1.3	-1.4	-1.4	-3.2	-1.6	-3.0	-4.5	-4.7
-5.1	-5.2	-5.2	-6.7	-5.8	-5.7	-4.0	-2.2	-1.6	-.9	-.6	-2.6	-7.3	-6.0	-4.1	-2.9	-1.5	-.7	-.6	-.8	-5.3	-4.4	-2.2	-1.2	-1.1	-1.6	-.9	-.8	-.9	-.9	-2.3	-4.2	-1.2	-1.2	-1.5	-2.9
-3.3	-4.4	-4.9	-5.0	-4.4	-5.0	-6.0	-7.1	-5.8	-3.6	-1.8	-3.7	-6.8	-4.6	-4.5	-5.4	-4.4	-3.0	-2.4	-1.2	-2.5	-3.3	-3.6	-3.6	-3.5	-3.1	-2.6	-2.1	-1.8	-2.1	-2.6	-2.1	-2.0	-2.8	-2.8	-3.0
-3.2	-2.6	-3.2	-3.3	-3.4	-3.1	-2.9	-3.6	-3.5	-3.7	-4.4	-3.4	-2.8	-3.5	-4.0	-4.6	-4.8	-4.3	-3.8	-3.6	-3.2	-3.5	-3.7	-4.0	-4.4	-4.3	-4.0	-3.6	-3.0	-2.9	-2.4	-2.4	-2.8	-3.2	-3.5	-3.8
-3.3	-2.9	-2.9	-2.4	-2.5	-2.6	-2.7	-2.7	-3.0	-3.1	-3.8	-3.8	-3.3	-3.0	-3.3	-3.1	-3.1	-3.2	-3.0	-3.1	-3.1	-3.4	-3.4	-3.2	-3.0	-3.3	-3.6	-3.1	-3.0	-3.3	-3.2	-2.7	-2.8	-3.1	-3.6	-3.6
-2.8	-2.6	-2.6	-2.7	-2.5	-2.5	-2.8	-2.6	-2.5	-2.5	-2.6	-3.6	-3.4	-3.2	-3.0	-3.2	-3.0	-2.9	-3.0	-3.1	-3.2	-3.4	-3.1	-2.5	-2.3	-2.4	-2.4	-2.7	-2.8	-2.5	-2.1	-1.8	-2.1	-2.3	-2.8	-3.1
-2.8	-2.9	-3.0	-2.8	-2.3	-2.0	-2.1	-2.2	-1.8	-1.6	-1.7	-1.6	-2.0	-2.2	-2.5	-2.4	-2.3	-2.2	-2.1	-2.1	-2.1	-1.8	-1.6	-1.5	-1.1	-1.2	-1.5	-1.7	-1.5	-1.2	-1.0	-.8	-.8	-1.0	-2.1	-2.7
-1.1	-1.3	-1.2	-1.0	-.7	-.7	-.9	-1.1	-1.0	-.6	-.8	-1.1	-1.1	-1.1	-1.3	-1.4	-1.6	-1.8	-1.9	-1.9	-1.9	-1.9	-1.9	-2.0	-1.9	-1.9	-1.9	-1.9	-1.8	-1.6	-1.3	-1.0	-.8	-.6	-.3	-.8	-1.1

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



2.0	1.8	1.6	1.5	1.4	1.2	1.1	1.1	1.2	1.2	1.3	1.2	1.2	1.2	1.5	1.5	1.6	1.8	2.4	2.6	2.9	2.5	2.1	2.0	2.2	1.9	1.5	1.3	1.3	1.3	1.5	1.7	1.7	1.3	1.5	1.7
2.3	2.3	2.1	1.8	1.7	1.7	1.6	1.6	1.9	1.7	1.8	2.0	2.3	2.2	2.0	3.6	4.3	4.1	4.0	4.0	4.1	4.1	3.3	3.4	3.1	2.5	2.1	2.1	1.7	1.2	1.3	1.3	1.5	1.6	1.4	1.7
3.7	3.7	4.1	3.5	3.3	3.3	3.1	2.7	2.5	2.7	2.7	3.3	3.9	4.7	4.4	5.0	5.2	5.4	5.3	4.8	4.0	4.0	3.6	3.7	3.2	2.8	2.3	2.2	1.7	1.5	1.3	1.7	2.2	2.9	3.3	3.5
5.3	5.8	5.2	4.5	5.2	5.1	4.3	3.0	2.6	3.4	4.2	5.0	5.9	5.8	5.2	5.8	6.0	6.1	6.1	6.2	4.9	4.3	3.9	2.9	2.8	2.8	3.2	3.4	2.8	2.2	1.8	2.1	3.0	3.7	5.0	5.7
6.1	5.4	5.4	5.0	5.3	6.0	5.2	4.4	4.6	5.9	6.5	7.4	7.0	6.8	6.2	6.0	5.7	6.3	5.9	5.6	4.8	4.4	4.2	4.0	5.1	6.2	5.0	4.4	3.9	3.3	3.5	6.8	5.4	6.7	7.7	6.9
7.3	7.0	7.2	6.6	7.1	5.6	6.0	6.8	6.0	5.9	8.9	6.4	7.9	9.2	7.2	4.9	4.3	5.8	7.2	5.9	4.6	4.5	5.2	5.2	5.7	6.2	5.6	6.0	5.6	4.8	4.4	6.3	7.5	7.3	7.2	6.2
9.2	6.5	5.3	7.3	7.6	4.4	4.0	4.9	4.6	5.4	5.4	6.6	8.4	7.8	6.7	3.8	2.9	4.0	5.0	4.8	3.3	4.1	5.1	3.2	2.2	2.7	2.5	2.1	2.3	3.0	4.3	4.3	3.0	1.6	3.4	9.5
7.7	5.6	6.1	6.2	7.6	8.9	8.5	6.6	6.7	9.9	8.5	9.9	7.5	6.2	5.7	5.5	6.9	7.4	4.6	3.6	2.4	2.6	1.9	3.7	4.1	5.0	5.2	3.1	4.5	5.1	6.6	6.9	7.1	5.4	7.1	9.1
9.7	8.6	8.7	8.8	9.2	8.5	7.4	6.2	7.3	8.1	11.4	9.9	6.5	7.5	10.1	10.4	9.8	8.5	9.5	7.7	9.7	7.0	5.9	7.1	8.0	11.3	10.9	11.0	10.6	9.8	7.4	8.4	8.6	9.0	9.3	6.6
6.8	4.9	3.9	2.6	1.0	.8	.6	.7	.7	1.8	10.1	12.3	10.7	7.9	3.3	3.2	1.3	1.2	5.2	10.7	10.7	6.5	3.5	5.7	6.3	9.5	11.5	10.7	10.7	10.4	6.9	8.1	10.7	10.6	10.3	7.4
8.2	7.9	7.6	8.2	5.1	3.0	1.0	.9	.9	1.3	6.6	9.2	10.9	9.6	5.5	2.6	1.8	.6	1.4	10.1	9.5	6.5	4.6	4.2	6.0	7.3	5.0	2.7	2.9	3.8	4.3	5.7	3.7	5.9	7.8	7.8
6.9	7.7	8.5	9.4	7.8	8.0	6.6	4.3	2.8	1.2	1.8	8.9	11.5	8.2	6.7	5.5	3.4	1.9	1.9	4.7	9.2	8.4	5.5	3.4	2.9	4.2	2.7	1.4	1.8	5.2	6.5	7.8	4.5	8.0	3.5	4.7
5.7	6.6	6.7	7.1	6.5	7.2	7.8	7.9	6.3	5.0	4.2	8.7	10.8	7.5	6.9	7.4	6.4	5.5	4.7	3.2	6.1	6.3	6.3	6.1	5.9	4.9	4.3	3.5	3.0	4.7	5.7	5.5	6.2	5.6	5.3	5.7
4.7	4.0	4.8	5.0	4.7	4.3	4.4	5.6	5.1	4.9	5.4	6.0	5.1	5.1	6.0	6.5	5.9	5.4	5.0	4.7	4.3	5.1	5.4	5.6	5.9	5.4	4.9	4.5	4.0	4.2	4.1	4.2	4.4	4.4	4.8	5.6
3.9	3.7	3.8	3.2	3.1	3.1	3.1	2.9	3.2	3.5	4.0	4.6	4.0	3.8	4.0	3.9	4.2	4.3	3.5	3.3	3.1	3.3	3.7	3.4	3.8	4.0	3.9	3.9	4.1	3.9	3.8	3.5	3.2	3.2	3.5	3.6
2.5	2.5	2.9	2.8	2.8	2.9	2.7	2.6	2.5	2.4	2.7	3.5	3.5	2.7	2.3	2.6	2.3	2.4	2.4	2.4	2.4	2.7	2.7	2.6	2.6	2.5	2.6	3.1	3.5	3.3	2.9	2.6	2.4	2.1	2.1	2.3
2.2	2.2	2.4	2.5	2.2	2.2	2.3	2.6	2.4	2.1	2.2	1.9	1.8	1.7	1.8	2.2	2.4	2.4	2.5	2.3	2.5	2.3	1.5	1.1	1.3	1.4	1.1	1.0	.9	.8	.8	.8	.8	1.2	2.2	2.1
1.3	1.5	1.4	1.4	1.2	1.2	1.1	1.1	1.1	.8	.8	.9	.9	1.0	1.2	1.4	1.3	1.4	1.3	1.4	1.6	1.5	1.2	1.0	.9	.9	.8	.7	.6	.5	.5	.6	.7	1.1	1.3	1.2

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

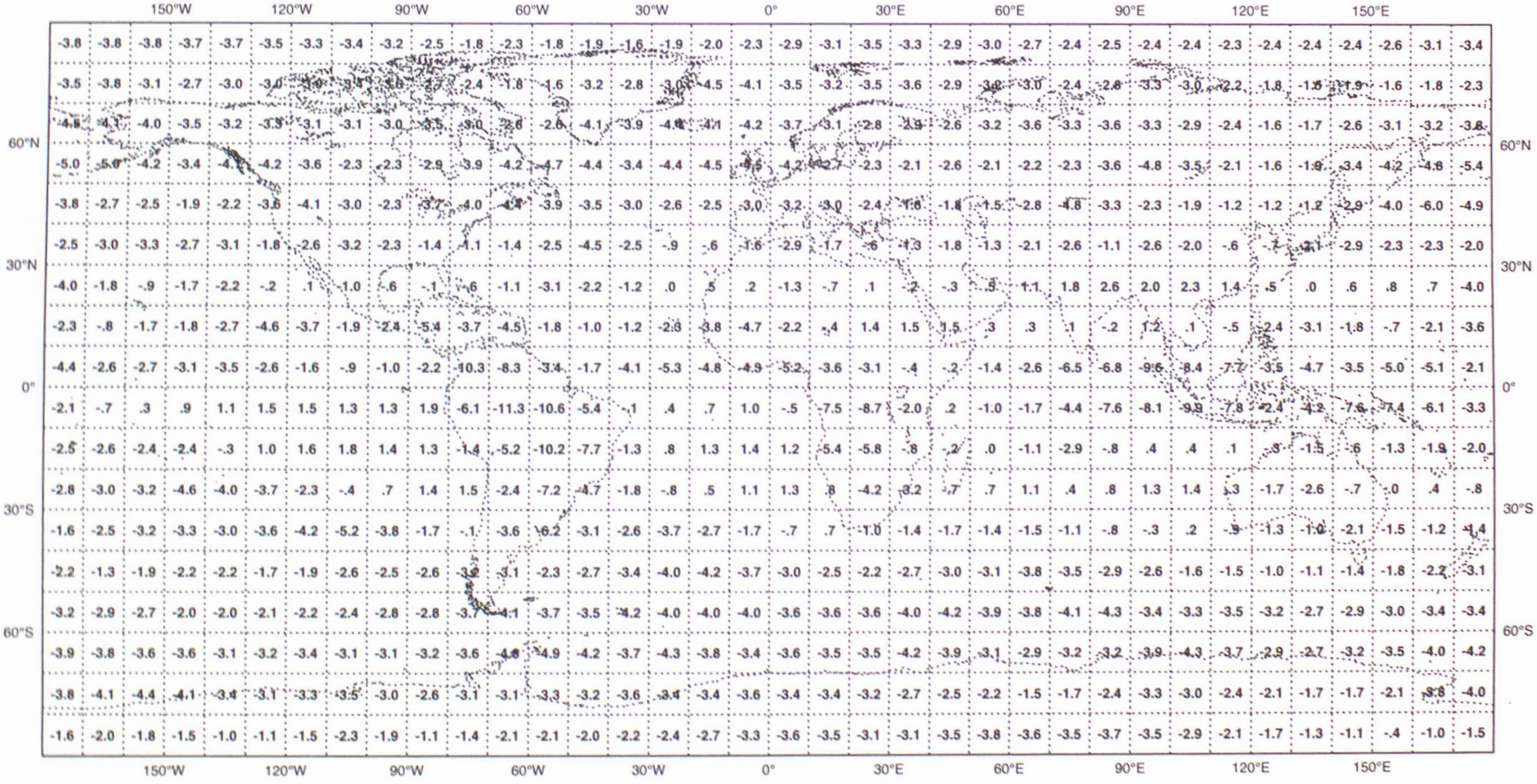
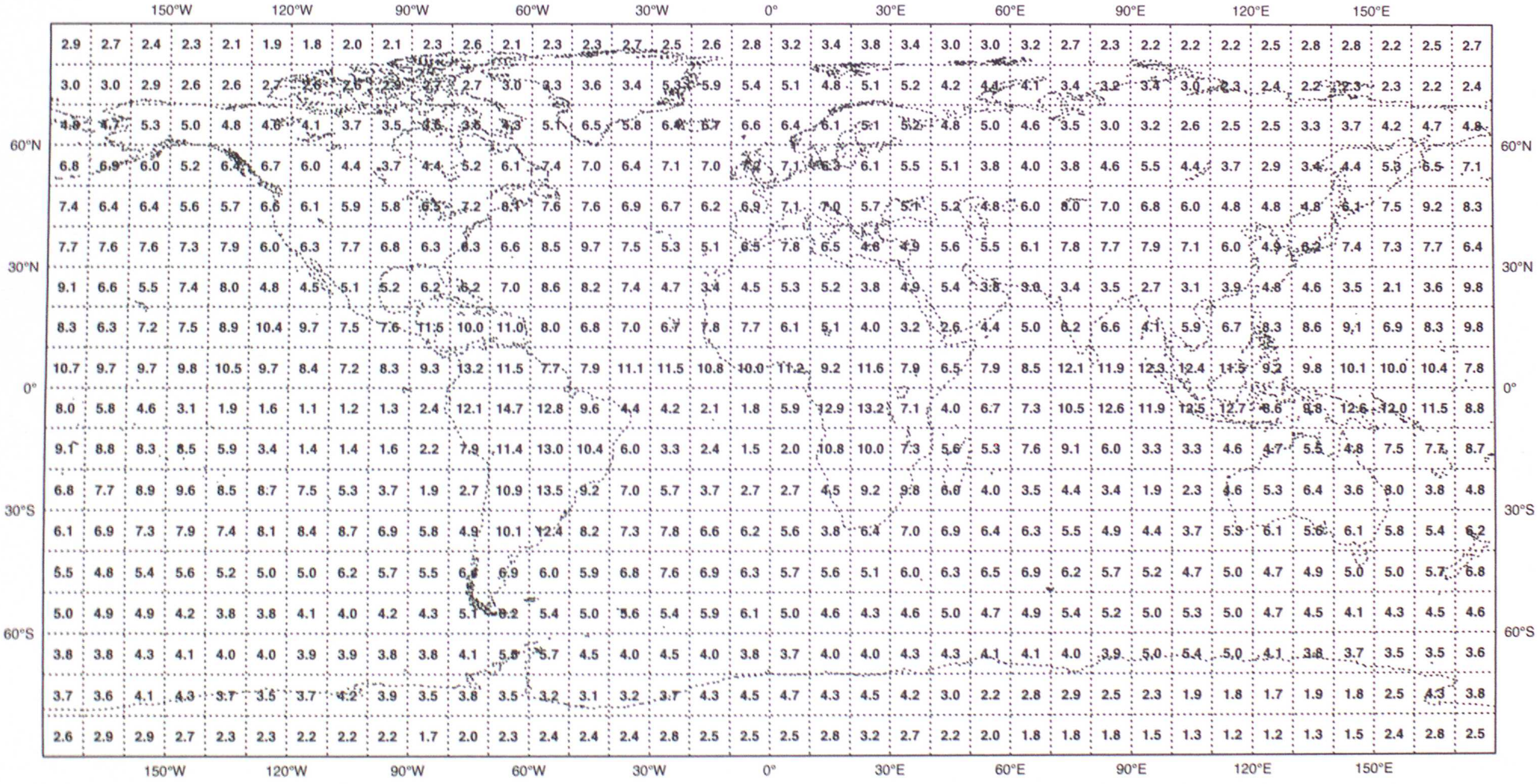

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-3.8 -3.8 -3.8 -3.7 -3.7 -3.5 -3.3 -3.4 -3.2 -2.5 -1.8 -2.3 -1.8 -1.9 -1.6 -1.9 -2.0 -2.3 -2.9 -3.1 -3.5 -3.3 -2.9 -3.0 -2.7 -2.4 -2.5 -2.4 -2.4 -2.3 -2.4 -2.4 -2.4 -2.6 -3.1 -3.4
-3.5 -3.8 -3.1 -2.7 -3.0 -3.0 -3.0 -3.1 -4.6 -4.7 -2.4 -1.8 -1.6 -3.2 -2.8 -3.0 -4.5 -4.1 -3.5 -3.2 -3.5 -3.6 -2.9 -3.8 -3.0 -2.4 -2.8 -3.3 -3.0 -2.2 -1.8 -1.5 -1.9 -1.6 -1.8 -2.3
-4.6 -4.1 -4.0 -3.5 -3.2 -3.3 -3.1 -3.1 -3.0 -3.5 -3.0 -2.6 -2.6 -4.1 -3.9 -4.8 -4.1 -4.2 -3.7 -3.1 -2.8 -2.9 -2.6 -3.2 -3.6 -3.3 -3.6 -3.3 -2.9 -2.4 -1.6 -1.7 -2.6 -3.1 -3.2 -3.6
-5.0 -5.0 -4.2 -3.4 -4.1 -4.2 -3.6 -2.3 -2.3 -2.9 -3.9 -4.2 -4.7 -4.4 -3.4 -4.4 -4.5 -4.5 -4.2 -2.7 -2.3 -2.1 -2.6 -2.1 -2.2 -2.3 -3.6 -4.8 -3.5 -2.1 -1.6 -1.9 -3.4 -4.2 -4.8 -5.4
-3.8 -2.7 -2.5 -1.9 -2.2 -3.6 -4.1 -3.0 -2.3 -3.7 -4.0 -4.4 -3.9 -3.5 -3.0 -2.6 -2.5 -3.0 -3.2 -3.0 -2.4 -1.6 -1.8 -1.5 -2.8 -4.8 -3.3 -2.3 -1.9 -1.2 -1.2 -1.2 -2.9 -4.0 -6.0 -4.9
-2.5 -3.0 -3.3 -2.7 -3.1 -1.8 -2.6 -3.2 -2.3 -1.4 -1.1 -1.4 -2.5 -4.5 -2.5 -.9 -.6 -1.6 -2.9 -1.7 -.6 -1.3 -1.8 -1.3 -2.1 -2.6 -1.1 -2.6 -2.0 -.6 -.7 -2.1 -2.9 -2.3 -2.3 -2.0
-4.0 -1.8 -.9 -1.7 -2.2 -.2 .1 -1.0 -.6 -.1 -.6 -1.1 -3.1 -2.2 -1.2 .0 .5 .2 -1.3 -.7 .1 -.2 -.3 .5 1.1 1.8 2.6 2.0 2.3 1.4 .5 .0 .6 .8 .7 -4.0
-2.3 -.8 -1.7 -1.8 -2.7 -4.6 -3.7 -1.9 -2.4 -5.4 -3.7 -4.5 -1.8 -1.0 -1.2 -2.8 -3.8 -4.7 -2.2 .4 1.4 1.5 1.5 .3 .3 .1 -.2 1.2 .1 -.5 -2.4 -3.1 -1.8 -.7 -2.1 -3.6
-4.4 -2.6 -2.7 -3.1 -3.5 -2.6 -1.6 -.9 -1.0 -2.2 -10.3 -8.3 -3.4 -1.7 -4.1 -5.3 -4.8 -4.9 -5.2 -3.6 -3.1 -.4 -.2 -1.4 -2.6 -6.5 -6.8 -9.6 -8.4 -7.7 -3.5 -4.7 -3.5 -5.0 -5.1 -2.1
-2.1 -.7 .3 .9 1.1 1.5 1.5 1.3 1.3 1.9 -6.1 -11.3 -10.6 -5.4 -.1 .4 .7 1.0 -.5 -7.5 -8.7 -2.0 .2 -1.0 -1.7 -4.4 -7.6 -8.1 -9.9 -7.8 -2.4 -4.2 -7.6 -7.4 -6.1 -3.3
-2.5 -2.6 -2.4 -2.4 -.3 1.0 1.6 1.8 1.4 1.3 -1.4 -5.2 -10.2 -7.7 -1.3 .8 1.3 1.4 1.2 -5.4 -5.8 -.8 -.2 .0 -1.1 -2.9 -.8 .4 .4 .1 -.8 -1.5 -.6 -1.3 -1.9 -2.0
-2.8 -3.0 -3.2 -4.6 -4.0 -3.7 -2.3 -.4 .7 1.4 1.5 -2.4 -7.2 -4.7 -1.8 -.8 .5 1.1 1.3 .8 -4.2 -3.2 -.7 .7 1.1 .4 .8 1.3 1.4 .3 -1.7 -2.6 -.7 .0 .4 -.8
-1.6 -2.5 -3.2 -3.3 -3.0 -3.6 -4.2 -5.2 -3.8 -1.7 -.1 -3.6 -6.2 -3.1 -2.6 -3.7 -2.7 -1.7 -.7 .7 -1.0 -1.4 -1.7 -1.4 -1.5 -1.1 -.8 -.3 .2 -.9 -1.3 -1.0 -2.1 -1.5 -1.2 -1.4
-2.2 -1.3 -1.9 -2.2 -2.2 -1.7 -1.9 -2.6 -2.5 -2.6 -3.2 -3.1 -2.3 -2.7 -3.4 -4.0 -4.2 -3.7 -3.0 -2.5 -2.2 -2.7 -3.0 -3.1 -3.8 -3.5 -2.9 -2.6 -1.6 -1.5 -1.0 -1.1 -1.4 -1.8 -2.2 -3.1
-3.2 -2.9 -2.7 -2.0 -2.0 -2.1 -2.2 -2.4 -2.8 -2.8 -3.7 -4.1 -3.7 -3.5 -4.2 -4.0 -4.0 -4.0 -3.6 -3.6 -3.6 -4.0 -4.2 -3.9 -3.8 -4.1 -4.3 -3.4 -3.3 -3.5 -3.2 -2.7 -2.9 -3.0 -3.4 -3.4
-3.9 -3.8 -3.6 -3.6 -3.1 -3.2 -3.4 -3.1 -3.1 -3.2 -3.6 -4.6 -4.9 -4.2 -3.7 -4.3 -3.8 -3.4 -3.6 -3.5 -3.5 -4.2 -3.9 -3.1 -2.9 -3.2 -3.2 -3.9 -4.3 -3.7 -2.9 -2.7 -3.2 -3.5 -4.0 -4.2
-3.8 -4.1 -4.4 -4.1 -3.4 -3.1 -3.3 -3.5 -3.0 -2.6 -3.1 -3.1 -3.3 -3.2 -3.6 -3.4 -3.4 -3.6 -3.4 -3.4 -3.2 -2.7 -2.5 -2.2 -1.5 -1.7 -2.4 -3.3 -3.0 -2.4 -2.1 -1.7 -1.7 -2.1 -3.8 -4.0
-1.6 -2.0 -1.8 -1.5 -1.0 -1.1 -1.5 -2.3 -1.9 -1.1 -1.4 -2.1 -2.1 -2.0 -2.2 -2.4 -2.7 -3.3 -3.6 -3.5 -3.1 -3.1 -3.5 -3.8 -3.6 -3.5 -3.7 -3.5 -2.9 -2.1 -1.7 -1.3 -1.1 -.4 -1.0 -1.5
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



2.9	2.7	2.4	2.3	2.1	1.9	1.8	2.0	2.1	2.3	2.6	2.1	2.3	2.3	2.7	2.5	2.6	2.8	3.2	3.4	3.8	3.4	3.0	3.0	3.2	2.7	2.3	2.2	2.2	2.2	2.5	2.8	2.8	2.2	2.5	2.7
3.0	3.0	2.9	2.6	2.6	2.7	2.6	2.6	2.9	2.7	2.7	3.0	3.3	3.6	3.4	5.3	5.9	5.4	5.1	4.8	5.1	5.2	4.2	4.4	4.1	3.4	3.2	3.4	3.0	2.3	2.4	2.2	2.3	2.3	2.2	2.4
4.9	4.7	5.3	5.0	4.8	4.6	4.1	3.7	3.5	3.6	3.6	4.3	5.1	6.5	5.8	6.4	6.7	6.6	6.4	6.1	5.1	5.2	4.8	5.0	4.6	3.5	3.0	3.2	2.6	2.5	2.5	3.3	3.7	4.2	4.7	4.8
6.8	6.9	6.0	5.2	6.4	6.7	6.0	4.4	3.7	4.4	5.2	6.1	7.4	7.0	6.4	7.1	7.0	7.2	7.1	6.3	6.1	5.5	5.1	3.8	4.0	3.8	4.6	5.5	4.4	3.7	2.9	3.4	4.4	5.3	6.5	7.1
7.4	6.4	6.4	5.6	5.7	6.6	6.1	5.9	5.8	6.5	7.2	8.1	7.6	7.6	6.9	6.7	6.2	6.9	7.1	7.0	5.7	5.1	5.2	4.8	6.0	8.0	7.0	6.8	6.0	4.8	4.8	4.8	6.1	7.5	9.2	8.3
7.7	7.6	7.6	7.3	7.9	6.0	6.3	7.7	6.8	6.3	6.3	6.6	8.5	9.7	7.5	5.3	5.1	6.5	7.8	6.5	4.6	4.9	5.6	5.5	6.1	7.8	7.7	7.9	7.1	6.0	4.9	6.2	7.4	7.3	7.7	6.4
9.1	6.6	5.5	7.4	8.0	4.8	4.5	5.1	5.2	6.2	6.2	7.0	8.6	8.2	7.4	4.7	3.4	4.5	5.3	5.2	3.8	4.9	5.4	3.8	3.0	3.4	3.5	2.7	3.1	3.9	4.8	4.6	3.5	2.1	3.6	9.8
8.3	6.3	7.2	7.5	8.9	10.4	9.7	7.5	7.6	11.5	10.0	11.0	8.0	6.8	7.0	6.7	7.8	7.7	6.1	5.1	4.0	3.2	2.6	4.4	5.0	6.2	6.6	4.1	5.9	6.7	8.3	8.6	9.1	6.9	8.3	9.8
10.7	9.7	9.7	9.8	10.5	9.7	8.4	7.2	8.3	9.3	13.2	11.5	7.7	7.9	11.1	11.5	10.8	10.0	11.2	9.2	11.6	7.9	6.5	7.9	8.5	12.1	11.9	12.3	12.4	11.5	9.2	9.8	10.1	10.0	10.4	7.8
8.0	5.8	4.6	3.1	1.9	1.6	1.1	1.2	1.3	2.4	12.1	14.7	12.8	9.6	4.4	4.2	2.1	1.8	5.9	12.9	13.2	7.1	4.0	6.7	7.3	10.5	12.6	11.9	12.5	12.7	8.6	8.8	12.6	12.0	11.5	8.8
9.1	8.8	8.3	8.5	5.9	3.4	1.4	1.4	1.6	2.2	7.9	11.4	13.0	10.4	6.0	3.3	2.4	1.5	2.0	10.8	10.0	7.3	5.6	5.3	7.6	9.1	6.0	3.3	3.3	4.6	4.7	5.5	4.8	7.5	7.7	8.7
6.8	7.7	8.9	9.6	8.5	8.7	7.5	5.3	3.7	1.9	2.7	10.9	13.5	9.2	7.0	5.7	3.7	2.7	2.7	4.5	9.2	9.8	6.0	4.0	3.5	4.4	3.4	1.9	2.3	4.6	5.3	6.4	3.6	8.0	3.8	4.8
6.1	6.9	7.3	7.9	7.4	8.1	8.4	8.7	6.9	5.8	4.9	10.1	12.4	8.2	7.3	7.8	6.6	6.2	5.6	3.8	6.4	7.0	6.9	6.4	6.3	5.5	4.9	4.4	3.7	5.9	6.1	5.6	6.1	5.8	5.4	6.2
5.5	4.8	5.4	5.6	5.2	5.0	5.0	6.2	5.7	5.5	6.4	6.9	6.0	5.9	6.8	7.6	6.9	6.3	5.7	5.6	5.1	6.0	6.3	6.5	6.9	6.2	5.7	5.2	4.7	5.0	4.7	4.9	5.0	5.0	5.7	6.8
5.0	4.9	4.9	4.2	3.8	3.8	4.1	4.0	4.2	4.3	5.1	6.2	5.4	5.0	5.6	5.4	5.9	6.1	5.0	4.6	4.3	4.6	5.0	4.7	4.9	5.4	5.2	5.0	5.3	5.0	4.7	4.5	4.1	4.3	4.5	4.6
3.8	3.8	4.3	4.1	4.0	4.0	3.9	3.9	3.8	3.8	4.1	5.8	5.7	4.5	4.0	4.5	4.0	3.8	3.7	4.0	4.0	4.3	4.3	4.1	4.1	4.0	3.9	5.0	5.4	5.0	4.1	3.8	3.7	3.5	3.5	3.6
3.7	3.6	4.1	4.3	3.7	3.5	3.7	4.2	3.9	3.5	3.8	3.5	3.2	3.1	3.2	3.7	4.3	4.5	4.7	4.3	4.5	4.2	3.0	2.2	2.8	2.9	2.5	2.3	1.9	1.8	1.7	1.9	1.8	2.5	4.3	3.8
2.6	2.9	2.9	2.7	2.3	2.3	2.2	2.2	2.2	1.7	2.0	2.3	2.4	2.4	2.4	2.8	2.5	2.5	2.5	2.8	3.2	2.7	2.2	2.0	1.8	1.8	1.8	1.5	1.3	1.2	1.2	1.3	1.5	2.4	2.8	2.5

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

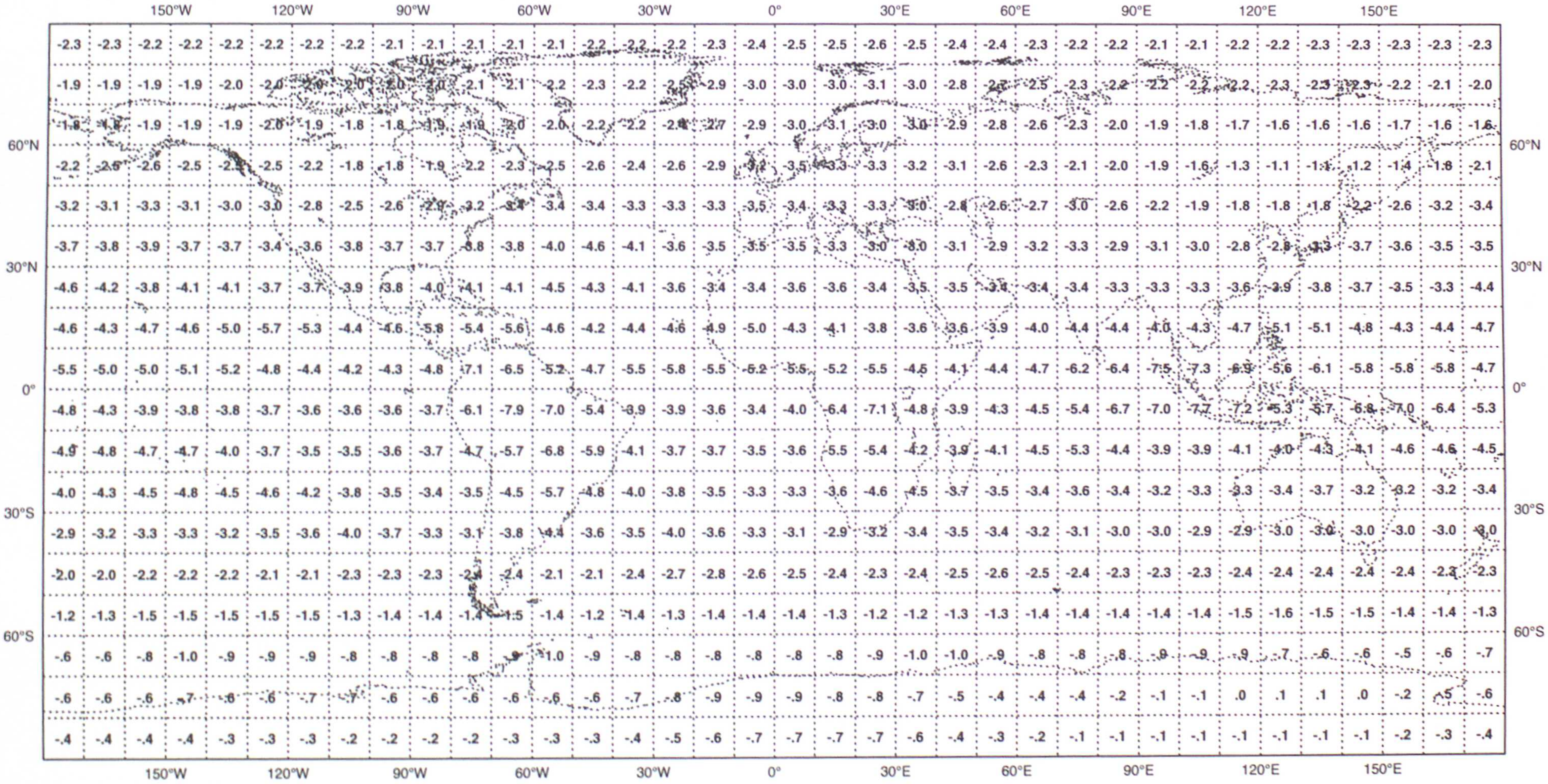

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-2.3 -2.3 -2.2 -2.2 -2.2 -2.2 -2.2 -2.2 -2.1 -2.1 -2.1 -2.1 -2.1 -2.2 -2.2 -2.2 -2.3 -2.4 -2.5 -2.5 -2.6 -2.5 -2.4 -2.4 -2.3 -2.2 -2.2 -2.1 -2.1 -2.2 -2.2 -2.3 -2.3 -2.3 -2.3 -2.3
-1.9 -1.9 -1.9 -1.9 -2.0 -2.0 -2.0 -2.0 -2.0 -2.0 -2.1 -2.1 -2.2 -2.3 -2.2 -2.5 -2.9 -3.0 -3.0 -3.0 -3.1 -3.0 -2.8 -2.7 -2.5 -2.3 -2.2 -2.2 -2.2 -2.2 -2.3 -2.3 -2.3 -2.2 -2.1 -2.0
-1.8 -1.8 -1.9 -1.9 -1.9 -2.0 -1.9 -1.8 -1.8 -1.9 -1.9 -2.0 -2.0 -2.2 -2.2 -2.8 -2.7 -2.9 -3.0 -3.1 -3.0 -3.0 -2.9 -2.8 -2.6 -2.3 -2.0 -1.9 -1.8 -1.7 -1.6 -1.6 -1.6 -1.7 -1.6 -1.6
-2.2 -2.6 -2.6 -2.5 -2.5 -2.5 -2.2 -1.8 -1.8 -1.9 -2.2 -2.3 -2.5 -2.6 -2.4 -2.6 -2.9 -3.2 -3.5 -3.3 -3.3 -3.2 -3.1 -2.6 -2.3 -2.1 -2.0 -1.9 -1.6 -1.3 -1.1 -1.1 -1.2 -1.4 -1.8 -2.1
-3.2 -3.1 -3.3 -3.1 -3.0 -3.0 -2.8 -2.5 -2.6 -2.9 -3.2 -3.4 -3.4 -3.4 -3.3 -3.3 -3.3 -3.5 -3.4 -3.3 -3.3 -3.0 -2.8 -2.6 -2.7 -3.0 -2.6 -2.2 -1.9 -1.8 -1.8 -1.8 -2.2 -2.6 -3.2 -3.4
-3.7 -3.8 -3.9 -3.7 -3.7 -3.4 -3.6 -3.8 -3.7 -3.7 -3.8 -3.8 -4.0 -4.6 -4.1 -3.6 -3.5 -3.5 -3.5 -3.3 -3.0 -3.0 -3.1 -2.9 -3.2 -3.3 -2.9 -3.1 -3.0 -2.8 -2.8 -3.3 -3.7 -3.6 -3.5 -3.5
-4.6 -4.2 -3.8 -4.1 -4.1 -3.7 -3.7 -3.9 -3.8 -4.0 -4.1 -4.1 -4.5 -4.3 -4.1 -3.6 -3.4 -3.4 -3.6 -3.6 -3.4 -3.5 -3.5 -3.4 -3.4 -3.4 -3.3 -3.3 -3.3 -3.6 -3.9 -3.8 -3.7 -3.5 -3.3 -4.4
-4.6 -4.3 -4.7 -4.6 -5.0 -5.7 -5.3 -4.4 -4.6 -5.8 -5.4 -5.6 -4.6 -4.2 -4.4 -4.6 -4.9 -5.0 -4.3 -4.1 -3.8 -3.6 -3.6 -3.9 -4.0 -4.4 -4.4 -4.0 -4.3 -4.7 -5.1 -5.1 -4.8 -4.3 -4.4 -4.7
-5.5 -5.0 -5.0 -5.1 -5.2 -4.8 -4.4 -4.2 -4.3 -4.8 -7.1 -6.5 -5.2 -4.7 -5.5 -5.8 -5.5 -5.2 -5.5 -5.2 -5.5 -4.5 -4.1 -4.4 -4.7 -6.2 -6.4 -7.5 -7.3 -6.9 -5.6 -6.1 -5.8 -5.8 -5.8 -4.7
-4.8 -4.3 -3.9 -3.8 -3.8 -3.7 -3.6 -3.6 -3.6 -3.7 -6.1 -7.9 -7.0 -5.4 -3.9 -3.9 -3.6 -3.4 -4.0 -6.4 -7.1 -4.8 -3.9 -4.3 -4.5 -5.4 -6.7 -7.0 -7.7 -7.2 -5.3 -5.7 -6.8 -7.0 -6.4 -5.3
-4.9 -4.8 -4.7 -4.7 -4.0 -3.7 -3.5 -3.5 -3.6 -3.7 -4.7 -5.7 -6.8 -5.9 -4.1 -3.7 -3.7 -3.5 -3.6 -5.5 -5.4 -4.2 -3.9 -4.1 -4.5 -5.3 -4.4 -3.9 -3.9 -4.1 -4.0 -4.3 -4.1 -4.6 -4.6 -4.5
-4.0 -4.3 -4.5 -4.8 -4.5 -4.6 -4.2 -3.8 -3.5 -3.4 -3.5 -4.5 -5.7 -4.8 -4.0 -3.8 -3.5 -3.3 -3.3 -3.6 -4.6 -4.5 -3.7 -3.5 -3.4 -3.6 -3.4 -3.2 -3.3 -3.3 -3.4 -3.7 -3.2 -3.2 -3.2 -3.4
-2.9 -3.2 -3.3 -3.3 -3.2 -3.5 -3.6 -4.0 -3.7 -3.3 -3.1 -3.8 -4.4 -3.6 -3.5 -4.0 -3.6 -3.3 -3.1 -2.9 -3.2 -3.4 -3.5 -3.4 -3.2 -3.1 -3.0 -3.0 -2.9 -2.9 -3.0 -3.0 -3.0 -3.0 -3.0 -3.0
-2.0 -2.0 -2.2 -2.2 -2.2 -2.1 -2.1 -2.3 -2.3 -2.3 -2.4 -2.4 -2.1 -2.1 -2.4 -2.7 -2.8 -2.6 -2.5 -2.4 -2.3 -2.4 -2.5 -2.6 -2.5 -2.4 -2.3 -2.3 -2.3 -2.4 -2.4 -2.4 -2.4 -2.4 -2.3 -2.3
-1.2 -1.3 -1.5 -1.5 -1.5 -1.5 -1.5 -1.3 -1.4 -1.4 -1.4 -1.5 -1.4 -1.2 -1.4 -1.3 -1.4 -1.4 -1.4 -1.3 -1.2 -1.2 -1.3 -1.3 -1.4 -1.4 -1.4 -1.4 -1.4 -1.5 -1.6 -1.5 -1.5 -1.4 -1.4 -1.3
-.6 -.6 -.8 -1.0 -.9 -.9 -.9 -.8 -.8 -.8 -.8 -.9 -1.0 -.9 -.8 -.8 -.8 -.8 -.8 -.8 -.9 -1.0 -1.0 -.9 -.8 -.8 -.8 -.9 -.9 -.9 -.7 -.6 -.6 -.5 -.6 -.7
-.6 -.6 -.6 -.7 -.6 -.6 -.7 -.7 -.6 -.6 -.6 -.6 -.6 -.6 -.7 -.8 -.9 -.9 -.9 -.8 -.8 -.7 -.5 -.4 -.4 -.4 -.2 -.1 -.1 .0 .1 .1 .0 -.2 -.5 -.6
-.4 -.4 -.4 -.4 -.3 -.3 -.3 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.4 -.5 -.6 -.7 -.7 -.7 -.7 -.6 -.4 -.3 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.3 -.4

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

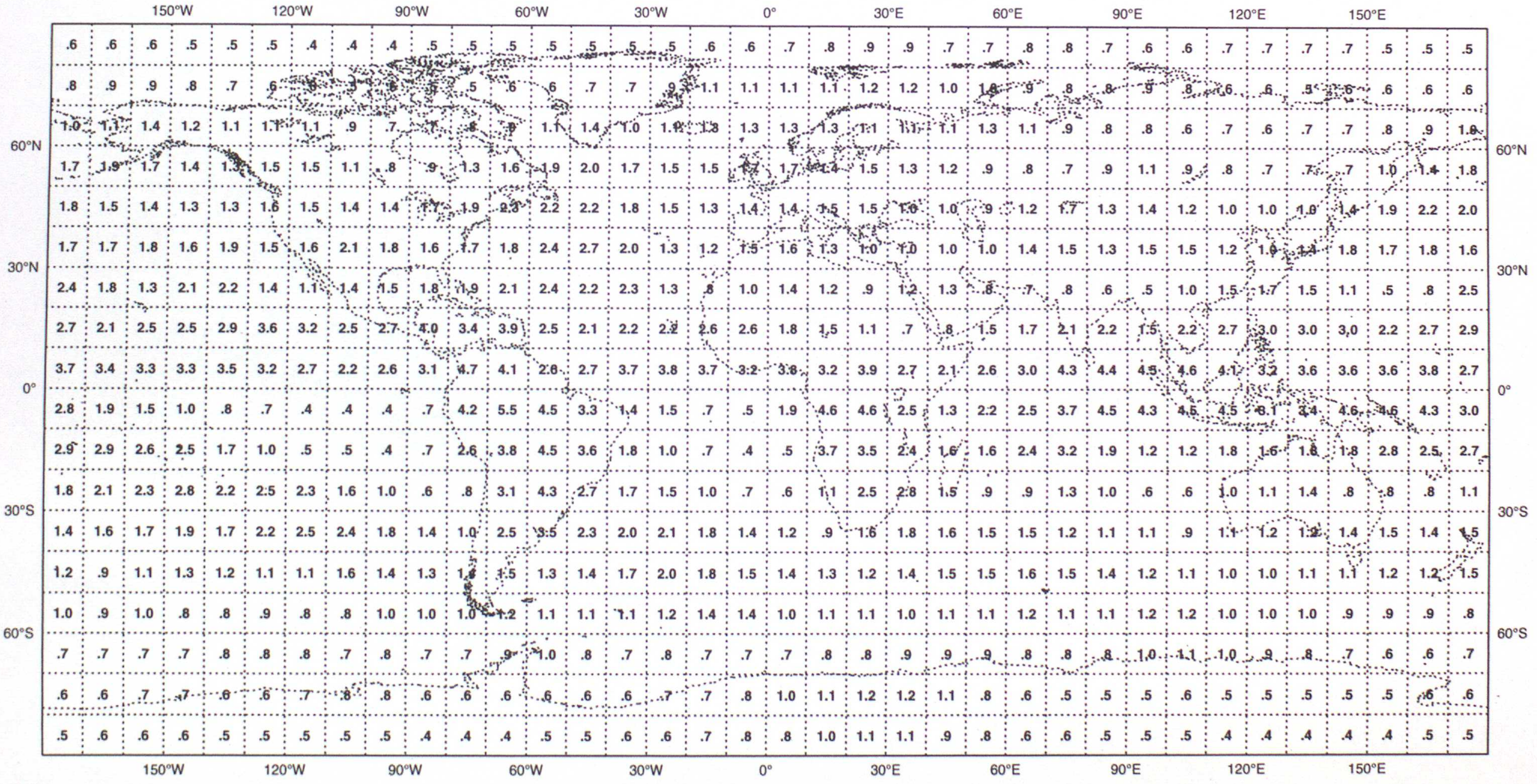

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.6 .6 .6 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .6 .6 .7 .8 .9 .9 .7 .7 .8 .8 .7 .6 .6 .7 .7 .7 .7 .5 .5 .5
.8 .9 .9 .8 .7 .6 .6 .5 .6 .5 .5 .6 .6 .7 .7 .9 1.1 1.1 1.1 1.1 1.2 1.2 1.0 1.0 .9 .8 .8 .9 .8 .6 .6 .5 .6 .6 .6 .6
1.0 1.1 1.4 1.2 1.1 1.1 1.1 .9 .7 .7 .8 .9 1.1 1.4 1.0 1.1 1.3 1.3 1.3 1.3 1.1 1.1 1.1 1.3 1.1 .9 .8 .8 .6 .7 .6 .7 .7 .8 .9 1.0
1.7 1.9 1.7 1.4 1.3 1.5 1.5 1.1 .8 .9 1.3 1.6 1.9 2.0 1.7 1.5 1.5 1.7 1.7 1.4 1.5 1.3 1.2 .9 .8 .7 .9 1.1 .9 .8 .7 .7 .7 1.0 1.4 1.8
1.8 1.5 1.4 1.3 1.3 1.6 1.5 1.4 1.4 1.7 1.9 2.3 2.2 2.2 1.8 1.5 1.3 1.4 1.4 1.5 1.5 1.0 1.0 .9 1.2 1.7 1.3 1.4 1.2 1.0 1.0 1.0 1.4 1.9 2.2 2.0
1.7 1.7 1.8 1.6 1.9 1.5 1.6 2.1 1.8 1.6 1.7 1.8 2.4 2.7 2.0 1.3 1.2 1.5 1.6 1.3 1.0 1.0 1.0 1.0 1.4 1.5 1.3 1.5 1.5 1.2 1.0 1.4 1.8 1.7 1.8 1.6
2.4 1.8 1.3 2.1 2.2 1.4 1.1 1.4 1.5 1.8 1.9 2.1 2.4 2.2 2.3 1.3 .8 1.0 1.4 1.2 .9 1.2 1.3 .8 .7 .8 .6 .5 1.0 1.5 1.7 1.5 1.1 .5 .8 2.5
2.7 2.1 2.5 2.5 2.9 3.6 3.2 2.5 2.7 4.0 3.4 3.9 2.5 2.1 2.2 2.2 2.6 2.6 1.8 1.5 1.1 .7 .8 1.5 1.7 2.1 2.2 1.5 2.2 2.7 3.0 3.0 3.0 2.2 2.7 2.9
3.7 3.4 3.3 3.3 3.5 3.2 2.7 2.2 2.6 3.1 4.7 4.1 2.8 2.7 3.7 3.8 3.7 3.2 3.8 3.2 3.9 2.7 2.1 2.6 3.0 4.3 4.4 4.5 4.6 4.1 3.2 3.6 3.6 3.6 3.8 2.7
2.8 1.9 1.5 1.0 .8 .7 .4 .4 .4 .7 4.2 5.5 4.5 3.3 1.4 1.5 .7 .5 1.9 4.6 4.6 2.5 1.3 2.2 2.5 3.7 4.5 4.3 4.5 4.5 6.1 3.4 4.6 4.6 4.3 3.0
2.9 2.9 2.6 2.5 1.7 1.0 .5 .5 .4 .7 2.6 3.8 4.5 3.6 1.8 1.0 .7 .4 .5 3.7 3.5 2.4 1.6 1.6 2.4 3.2 1.9 1.2 1.2 1.8 1.6 1.8 1.8 2.8 2.5 2.7
1.8 2.1 2.3 2.8 2.2 2.5 2.3 1.6 1.0 .6 .8 3.1 4.3 2.7 1.7 1.5 1.0 .7 .6 1.1 2.5 2.8 1.5 .9 .9 1.3 1.0 .6 .6 1.0 1.1 1.4 .8 .8 .8 1.1
1.4 1.6 1.7 1.9 1.7 2.2 2.5 2.4 1.8 1.4 1.0 2.5 3.5 2.3 2.0 2.1 1.8 1.4 1.2 .9 1.6 1.8 1.6 1.5 1.5 1.2 1.1 1.1 .9 1.1 1.2 1.2 1.4 1.5 1.4 1.5
1.2 .9 1.1 1.3 1.2 1.1 1.1 1.6 1.4 1.3 1.4 1.5 1.3 1.4 1.7 2.0 1.8 1.5 1.4 1.3 1.2 1.4 1.5 1.5 1.6 1.5 1.4 1.2 1.1 1.0 1.0 1.1 1.1 1.2 1.2 1.5
1.0 .9 1.0 .8 .8 .9 .8 .8 1.0 1.0 1.0 1.2 1.1 1.1 1.1 1.2 1.4 1.4 1.0 1.1 1.1 1.0 1.1 1.1 1.2 1.1 1.1 1.2 1.2 1.0 1.0 1.0 .9 .9 .9 .8
.7 .7 .7 .7 .8 .8 .8 .7 .8 .7 .7 .9 1.0 .8 .7 .8 .7 .7 .7 .8 .8 .9 .9 .9 .8 .8 .8 1.0 1.1 1.0 .9 .8 .7 .6 .6 .7
.6 .6 .7 .7 .6 .6 .7 .8 .8 .6 .6 .6 .6 .6 .6 .7 .7 .8 1.0 1.1 1.2 1.2 1.1 .8 .6 .5 .5 .5 .6 .5 .5 .5 .5 .5 .6 .6
.5 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .6 .6 .7 .8 .8 1.0 1.1 1.1 .9 .8 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

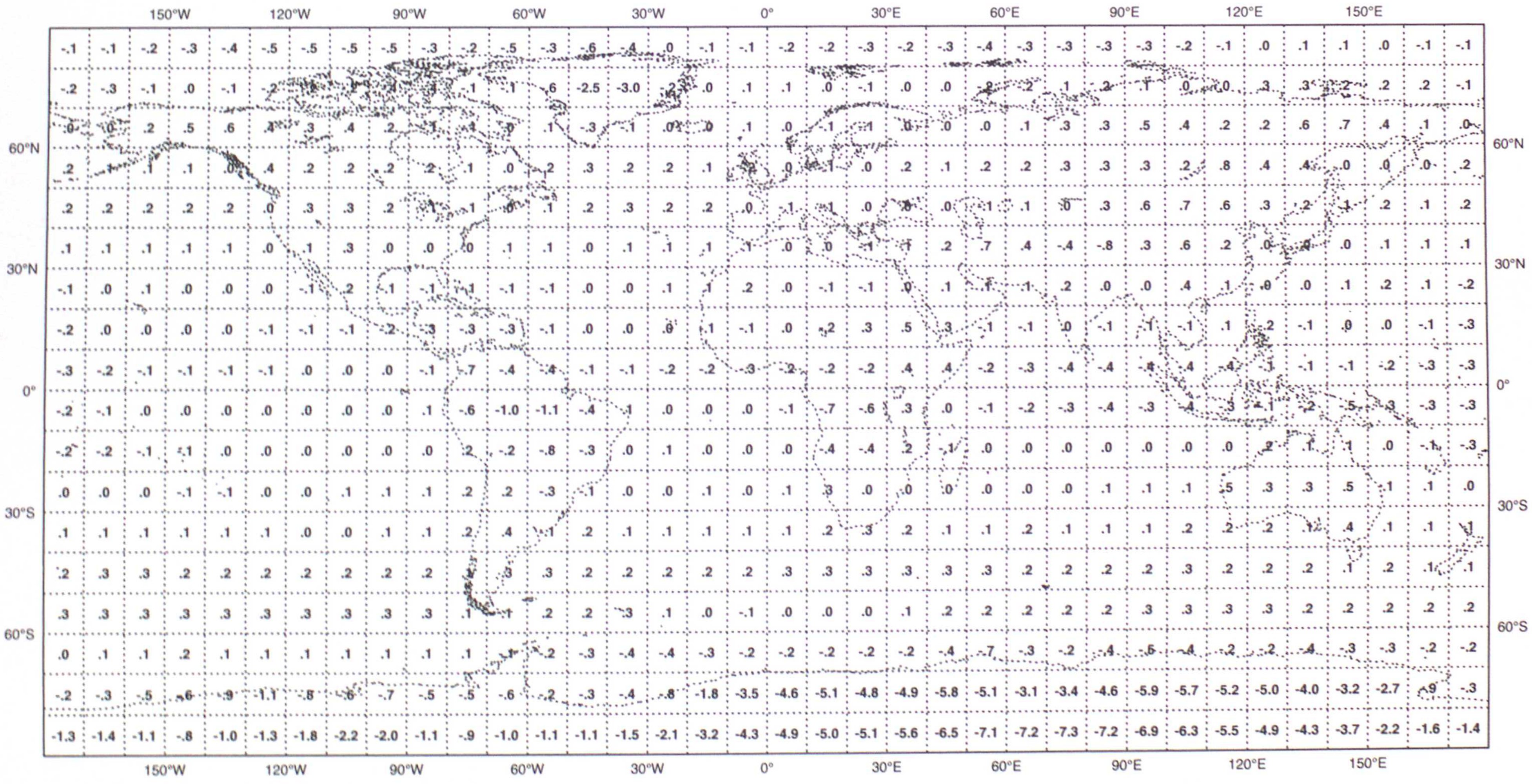
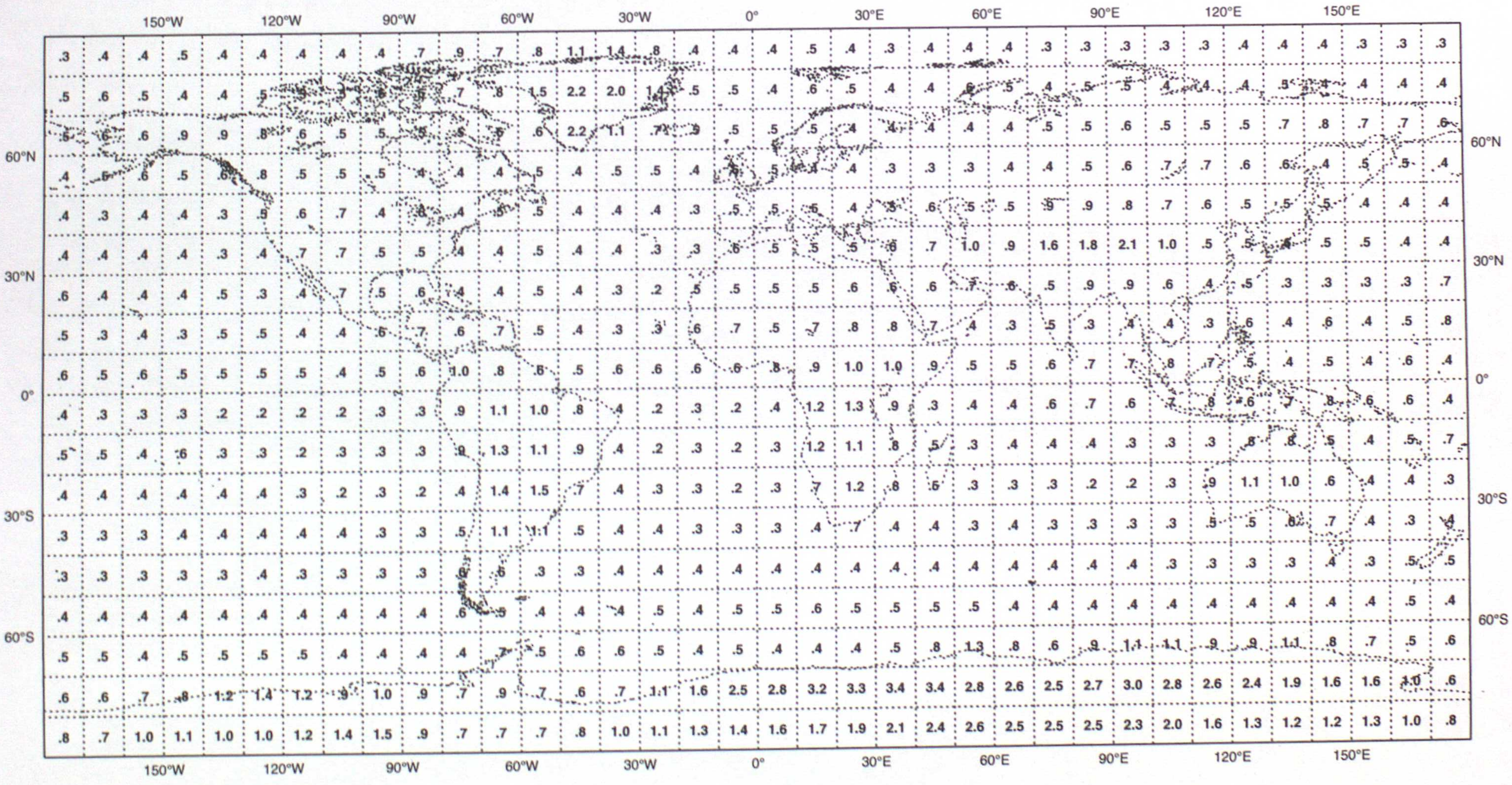

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .4 .4 .5 .4 .4 .4 .4 .4 .7 .9 .7 .8 1.1 1.4 .8 .4 .4 .4 .5 .4 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3
.5 .6 .5 .4 .4 .5 .5 .5 .6 .5 .7 .8 1.5 2.2 2.0 1.4 .5 .5 .4 .6 .5 .4 .4 .6 .5 .4 .5 .5 .4 .4 .4 .5 .4 .4 .4 .4
.5 .6 .6 .9 .9 .8 .6 .5 .5 .5 .5 .6 .6 2.2 1.1 .7 .9 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5 .6 .5 .5 .5 .7 .8 .7 .7 .6
.4 .5 .6 .5 .6 .8 .5 .5 .5 .4 .4 .4 .5 .4 .5 .5 .4 .5 .5 .4 .4 .3 .3 .3 .4 .4 .5 .6 .7 .7 .6 .6 .4 .5 .5 .4
.4 .3 .4 .4 .3 .5 .6 .7 .4 .8 .4 .5 .5 .4 .4 .4 .3 .5 .5 .6 .4 .5 .6 .5 .5 .9 .9 .8 .7 .6 .5 .5 .5 .4 .4 .4
.4 .4 .4 .4 .3 .4 .7 .7 .5 .5 .4 .4 .5 .4 .4 .3 .3 .6 .5 .5 .5 .6 .7 1.0 .9 1.6 1.8 2.1 1.0 .5 .5 .6 .5 .5 .4 .4
.6 .4 .4 .4 .5 .3 .4 .7 .5 .6 .4 .4 .5 .4 .3 .2 .5 .5 .5 .5 .6 .6 .6 .7 .6 .5 .9 .9 .6 .4 .5 .3 .3 .3 .3 .7
.5 .3 .4 .3 .5 .5 .4 .4 .6 .7 .6 .7 .5 .4 .3 .3 .6 .7 .5 .7 .8 .8 .7 .4 .3 .5 .3 .4 .4 .3 .6 .4 .6 .4 .5 .8
.6 .5 .6 .5 .5 .5 .5 .4 .5 .6 1.0 .8 .8 .5 .6 .6 .6 .6 .8 .9 1.0 1.0 .9 .5 .5 .6 .7 .7 .8 .7 .5 .4 .5 .4 .6 .4
.4 .3 .3 .3 .2 .2 .2 .2 .3 .3 .9 1.1 1.0 .8 .4 .2 .3 .2 .4 1.2 1.3 .9 .3 .4 .4 .6 .7 .6 .7 .8 .6 .7 .8 .6 .6 .4
.5 .5 .4 .6 .3 .3 .2 .3 .3 .3 .9 1.3 1.1 .9 .4 .2 .3 .2 .3 1.2 1.1 .8 .5 .3 .4 .4 .4 .3 .3 .3 .8 .8 .5 .4 .5 .7
.4 .4 .4 .4 .4 .4 .3 .2 .3 .2 .4 1.4 1.5 .7 .4 .3 .3 .2 .3 .7 1.2 .8 .5 .3 .3 .3 .2 .2 .3 .9 1.1 1.0 .6 .4 .4 .3
.3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .5 1.1 1.1 .5 .4 .4 .3 .3 .3 .4 .7 .4 .4 .3 .4 .3 .3 .3 .3 .5 .5 .8 .7 .4 .3 .4
.3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .6 .6 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .5 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .4 .5 .4 .5 .5 .6 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4
.5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .4 .7 .5 .6 .6 .5 .4 .5 .4 .4 .4 .5 .8 1.3 .8 .6 .9 1.1 1.1 .9 .9 1.1 .8 .7 .5 .6
.6 .6 .7 .8 1.2 1.4 1.2 .9 1.0 .9 .7 .9 .7 .6 .7 1.1 1.6 2.5 2.8 3.2 3.3 3.4 3.4 2.8 2.6 2.5 2.7 3.0 2.8 2.6 2.4 1.9 1.6 1.6 1.0 .6
.8 .7 1.0 1.1 1.0 1.0 1.2 1.4 1.5 .9 .7 .7 .7 .8 1.0 1.1 1.3 1.4 1.6 1.7 1.9 2.1 2.4 2.6 2.5 2.5 2.5 2.3 2.0 1.6 1.3 1.2 1.2 1.3 1.0 .8
60°N
30°N
0°
30°S
60°S
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

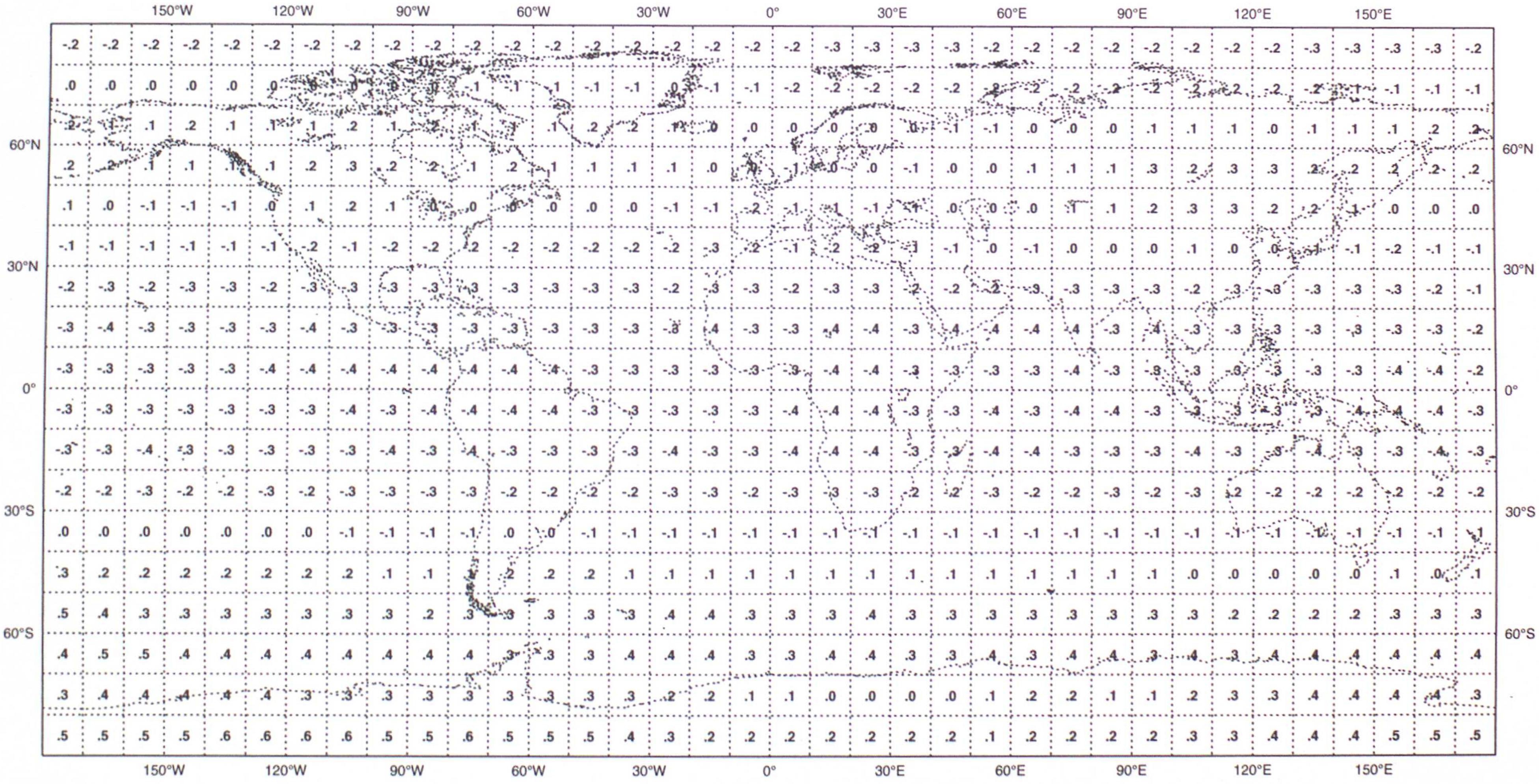

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

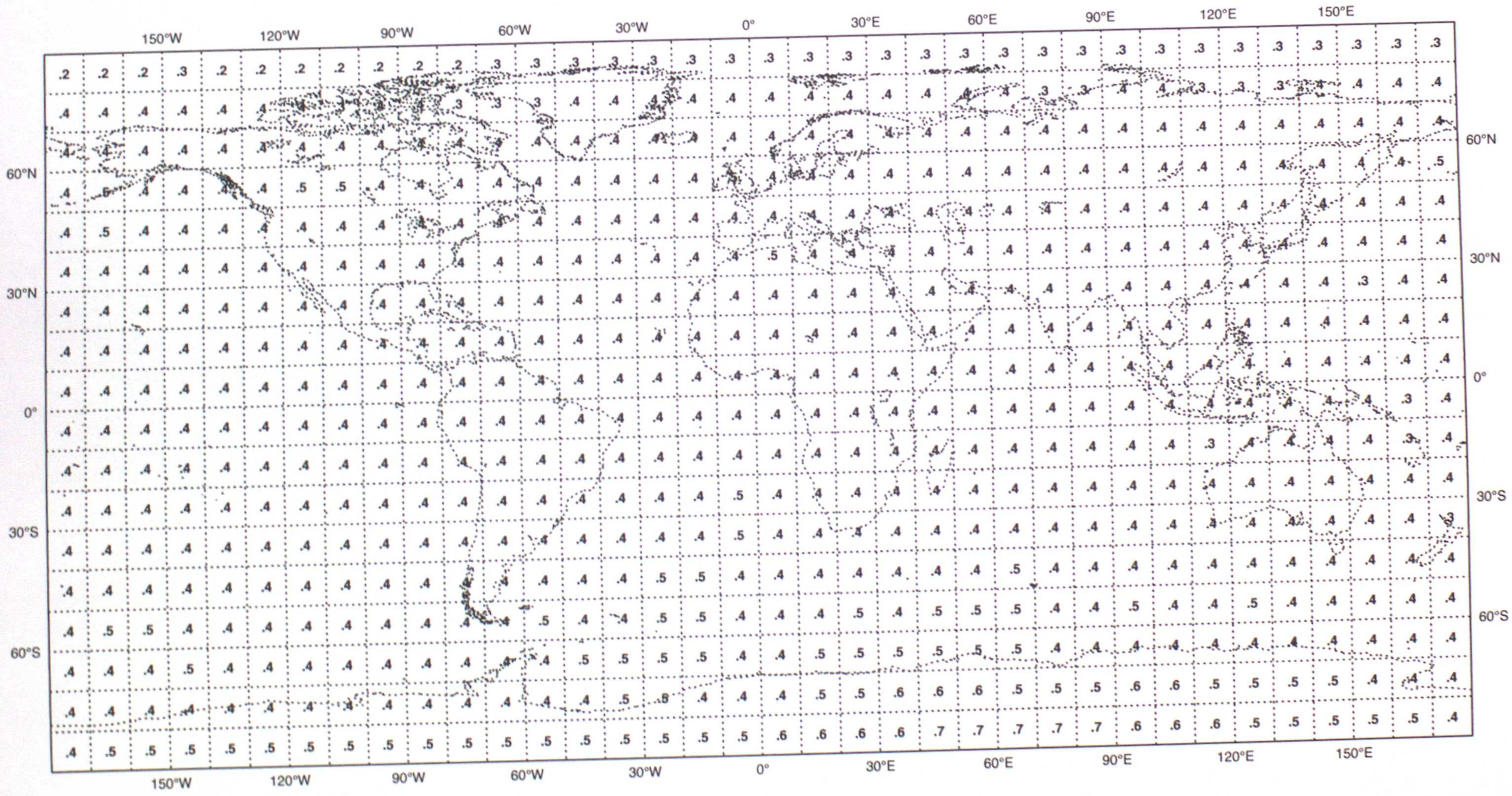

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

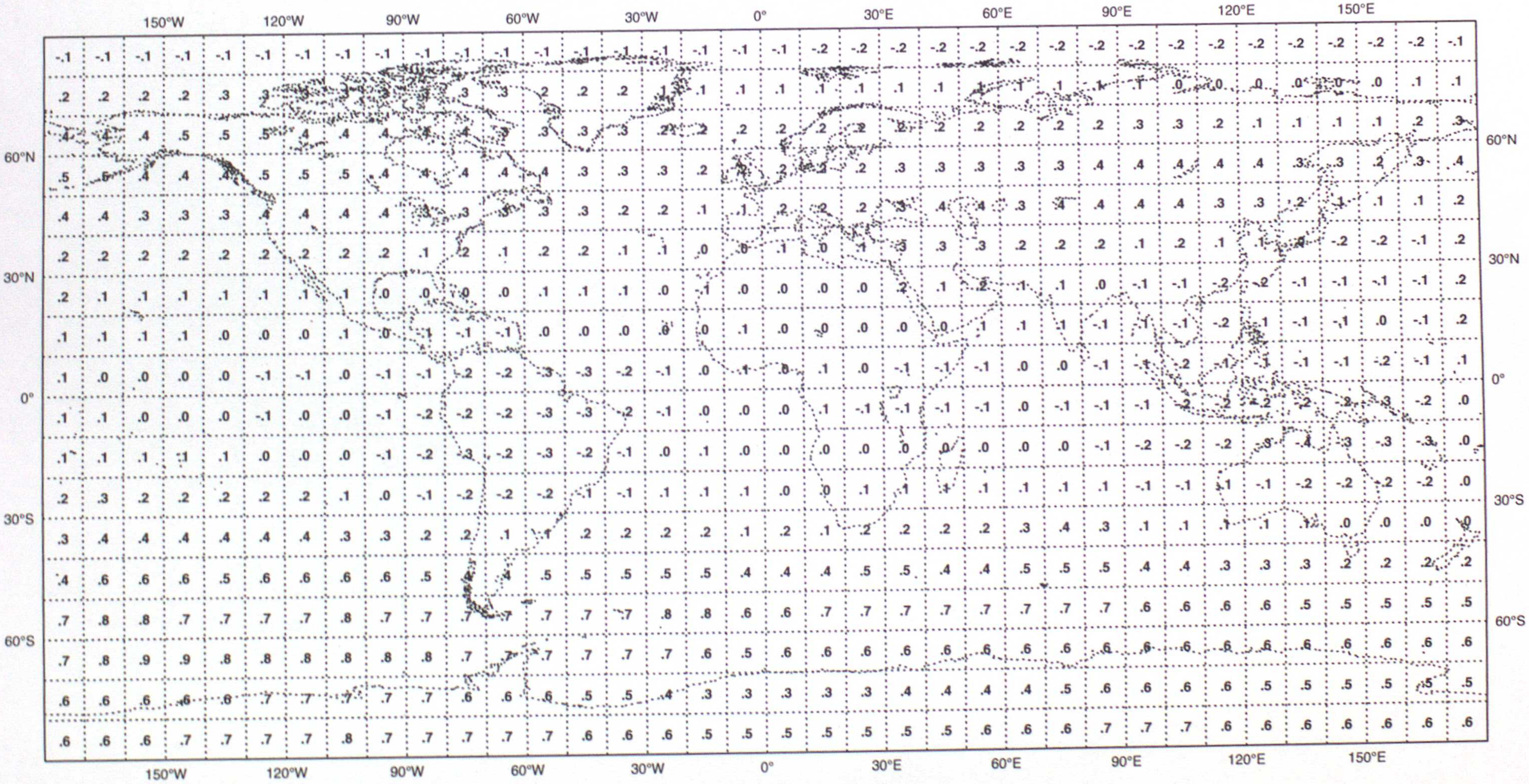

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

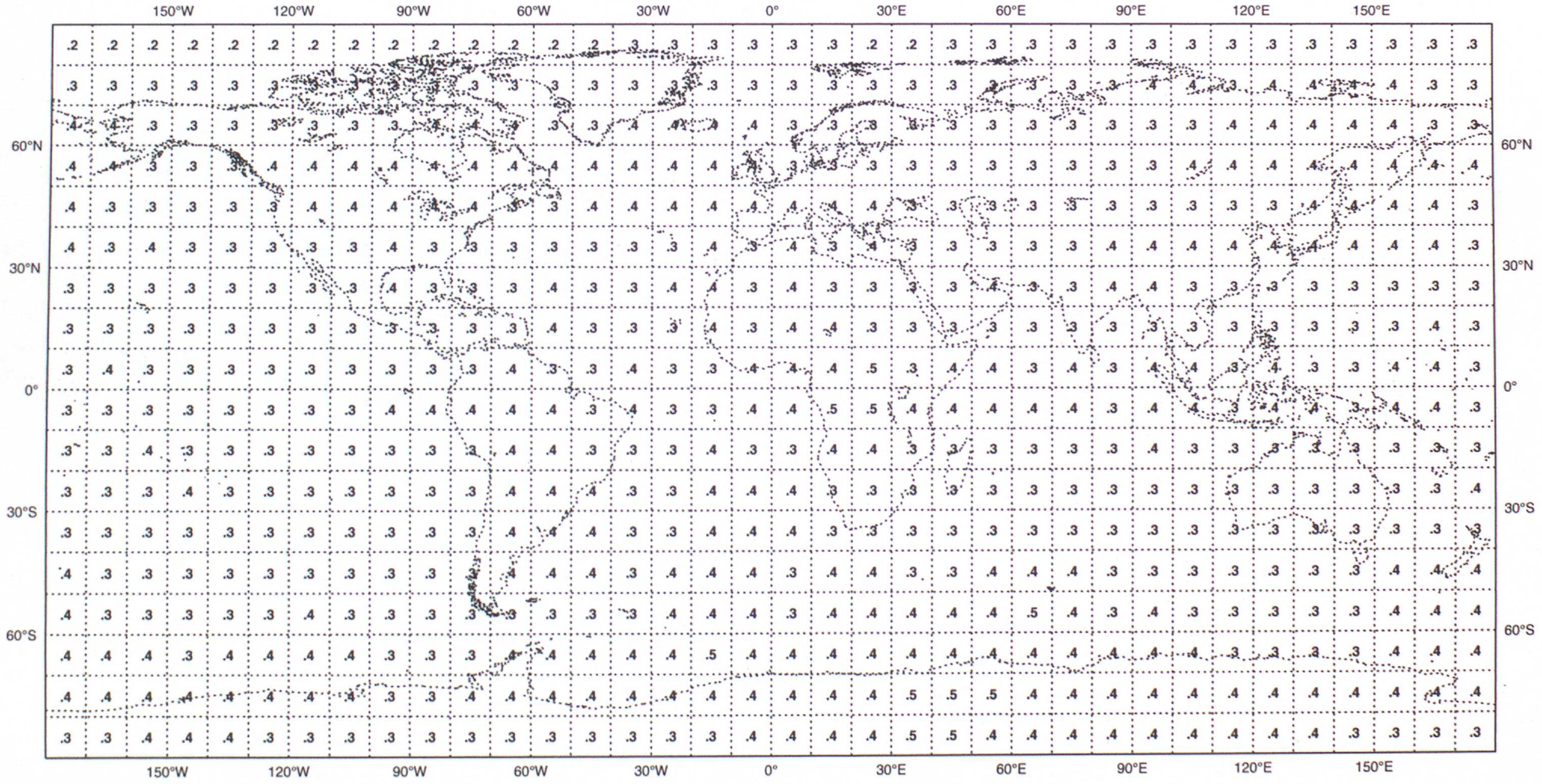

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .4 .4 .3 .3
.4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3
.4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4
.4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3
.4 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .3 .4 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3
.3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .4 .4 .4 .5 .3 .4 .4 .3 .4 .3 .4 .4 .3 .4 .3 .3 .4 .4 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .5 .5 .4 .4 .4 .4 .4 .3 .4 .4 .3 .4 .4 .3 .4 .4 .3
.3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .4 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .4 .4 .3 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4
.4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .5 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4
.4 .4 .4 .3 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	19.0	-33.5	P	577	0	22	0.5	0.6	0.8
13602	18.2	-36.0	P	438	0	0	0.5	0.2	0.5
41502	17.7	-75.1	P	850	2	70	2.0	1.2	2.3
41503	25.0	-66.2	P	72	1	100	0.6	0.3	0.7
41504	14.8	-63.9	P	1022	0	68	0.7	1.2	1.4
41520	10.2	-40.0	P	1017	0	68	0.6	1.1	1.2
41521	15.9	-52.0	P	805	0	100	0.9	-1.5	1.7
41522	20.2	-63.9	P	189	0	0	0.6	-0.2	0.6
41532	23.1	-69.8	P	519	0	0	0.5	0.3	0.6
41534	24.8	-62.8	P	582	0	11	0.7	0.0	0.7
41537	30.8	-62.8	P	66	0	27	0.4	0.6	0.7
41579	15.9	-61.3	P	39	0	0	0.4	-0.3	0.5
41590	19.5	-61.8	P	515	0	0	0.6	1.0	1.2
41594	25.4	-40.4	P	373	0	0	0.5	-0.2	0.6
41595	27.3	-44.5	P	348	0	0	0.5	0.6	0.8
41600	28.4	-79.9	P	53	0	4	0.9	-0.1	1.0
41630	27.4	-72.5	P	463	0	2	1.4	0.7	1.6
41631	27.9	-77.7	P	444	0	3	2.0	0.1	2.0
41646	23.7	-71.8	P	453	0	2	1.4	0.0	1.4
41647	20.1	-74.8	P	464	0	0	0.7	0.5	0.9
41655	19.8	-66.8	P	465	0	3	1.7	0.6	1.8
41659	28.8	-40.9	P	562	0	0	0.5	0.0	0.5
41666	35.0	-57.7	P	577	0	0	0.6	0.6	0.8
41907	29.8	-61.1	P	254	0	0	0.9	-0.2	0.9
41910	23.6	-68.9	P	284	0	0	0.5	0.2	0.5
41911	26.9	-62.1	P	312	0	0	0.5	-0.1	0.5
41913	24.4	-60.7	P	288	0	0	0.5	-0.4	0.6
41914	24.6	-60.1	P	282	0	0	0.5	0.6	0.8
41916	27.1	-60.5	P	292	0	0	0.5	0.1	0.5
41917	24.8	-65.2	P	218	0	0	0.4	0.1	0.5
44546	48.3	-44.5	P	589	0	1	0.8	0.1	0.8
44551	51.1	-33.5	P	682	0	1	0.7	0.5	0.9
44585	40.3	-68.2	P	255	0	20	1.1	1.1	1.6
44603	60.4	-21.0	P	1332	0	49	1.0	0.1	1.0
44605	51.8	-31.3	P	690	0	1	0.7	-0.2	0.7
44606	33.2	-65.1	P	687	0	1	0.5	-0.3	0.5
44608	34.3	-36.0	P	686	0	5	0.7	-0.1	0.7
44609	56.3	-11.5	P	651	0	2	0.9	-0.2	0.9
44611	61.2	-19.1	P	665	0	2	0.9	-0.2	0.9
44612	53.1	-43.2	P	345	0	0	0.7	-0.4	0.8
44613	54.6	-27.6	P	631	0	3	1.4	-0.2	1.5
44614	56.9	-38.1	P	681	0	5	0.9	-0.5	1.0
44621	62.3	-38.4	P	626	0	2	1.4	0.1	1.4
44622	56.4	-14.8	P	622	0	1	0.7	-0.1	0.7
44623	28.9	-44.1	P	670	0	1	0.6	-0.2	0.6
44626	41.4	-64.8	P	666	0	3	1.0	0.1	1.0
44628	36.4	-36.5	P	912	0	28	0.7	-0.4	0.8
44630	34.1	-45.3	P	700	0	6	0.8	0.5	1.0
44742	43.5	-50.1	P	598	0	0	0.7	0.2	0.8
44743	46.9	-44.8	P	585	0	1	0.7	0.0	0.7
44744	49.1	-35.8	P	690	0	2	1.2	1.0	1.6
44745	52.6	-39.9	P	694	0	1	0.8	-0.1	0.8
44746	55.6	-49.0	P	629	0	3	1.1	0.9	1.4
44747	49.2	-33.4	P	576	0	1	0.7	-0.7	1.0
44760	56.8	-37.6	P	57	0	9	0.5	0.2	0.5
44761	53.9	-49.3	P	635	0	2	1.0	-0.3	1.0
44764	60.8	-7.7	P	1330	0	50	0.8	-0.6	1.0
44765	45.1	-55.6	P	584	0	1	0.7	-0.7	1.0
44766	49.0	-34.0	P	343	0	1	0.8	-0.3	0.9
44768	57.9	-48.2	P	369	0	1	0.9	-0.2	1.0

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
44770	50.8	-28.7	P	143	0	18	0.8	-0.8	1.1
44771	45.9	-35.6	P	284	0	27	1.0	-0.8	1.3
44774	35.0	-8.9	P	163	0	13	0.7	-0.2	0.7
44777	34.6	-19.7	P	212	0	14	0.5	-0.3	0.5
44778	38.4	-25.2	P	271	0	18	0.5	0.0	0.6
44779	56.6	-12.4	P	339	0	28	0.8	0.0	0.8
44780	56.2	-40.7	P	506	0	36	0.8	-0.4	0.9
62513	31.7	-16.7	P	693	0	1	0.5	0.5	0.6
62514	34.1	-25.7	P	682	0	1	0.8	0.3	0.8
62515	22.9	-56.0	P	693	0	1	0.5	0.2	0.5
62517	26.8	-33.3	P	694	0	1	0.5	-0.5	0.7
62519	44.4	-4.7	P	693	0	2	0.7	0.0	0.7
62551	39.8	-24.2	P	1158	0	42	0.6	0.5	0.8
62552	34.8	-20.0	P	690	0	1	0.5	0.5	0.7
62574	47.7	-8.3	P	569	0	0	0.6	0.7	0.9
62598	56.2	-23.6	P	424	0	33	1.0	-0.2	1.1
62711	49.6	-43.1	P	627	1	5	1.7	0.4	1.8
62712	54.7	-30.8	P	1001	0	37	0.7	0.0	0.7
62801	37.0	-21.4	P	640	0	1	0.6	0.5	0.8
62802	31.5	-23.4	P	297	30	48	5.1	-2.5	5.7
62804	46.7	-9.4	P	638	0	1	0.9	-0.3	0.9
64523	65.5	-27.2	P	694	0	3	1.1	0.2	1.1
65591	60.2	-40.0	P	478	0	57	1.8	-0.1	1.8
65597	59.1	-51.5	P	517	0	34	1.0	-0.4	1.1
65598	63.4	-38.8	P	116	0	23	1.1	0.2	1.1

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	19.0	-33.5	SPEED	577	0	100	1.2	-1.2	1.7
13602	18.2	-36.0	SPEED	439	0	100	1.2	-1.1	1.6
41522	20.2	-63.9	SPEED	179	1	100	2.4	0.5	2.4
41532	23.1	-69.8	SPEED	514	0	100	1.4	-0.8	1.6
41590	19.5	-61.8	SPEED	492	0	100	1.9	-0.8	2.1
41594	25.4	-40.4	SPEED	360	0	100	1.4	0.1	1.4
41595	27.3	-44.5	SPEED	338	0	100	1.6	-0.5	1.6
41646	23.7	-71.8	SPEED	218	0	100	2.5	1.5	2.9
41647	20.1	-74.8	SPEED	121	0	100	2.7	1.0	2.9
41655	19.8	-66.8	SPEED	397	0	100	2.4	-0.1	2.4
44546	48.3	-44.5	SPEED	584	1	100	4.7	0.9	4.8
44551	51.1	-33.5	SPEED	650	0	100	2.3	0.9	2.5
62574	47.7	-8.3	SPEED	513	0	100	1.3	-1.1	1.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	19.0	-33.5	DIRN.	368	0	0	11.1	-1.7	11.3
13602	18.2	-36.0	DIRN.	318	0	0	10.4	-6.7	12.3
41522	20.2	-63.9	DIRN.	141	1	0	16.3	-12.8	20.7
41532	23.1	-69.8	DIRN.	344	0	0	31.9	-11.8	34.0
41590	19.5	-61.8	DIRN.	235	0	0	21.4	0.5	21.4
41594	25.4	-40.4	DIRN.	233	0	0	14.7	-7.9	16.7
41595	27.3	-44.5	DIRN.	158	0	0	35.7	5.0	36.0
41646	23.7	-71.8	DIRN.	190	0	0	21.4	12.3	24.7
41647	20.1	-74.8	DIRN.	92	0	0	21.0	8.8	22.8
41655	19.8	-66.8	DIRN.	295	0	0	22.5	1.9	22.5
44546	48.3	-44.5	DIRN.	499	1	0	35.2	23.4	42.3
44551	51.1	-33.5	DIRN.	606	0	0	11.9	-21.7	24.8
62574	47.7	-8.3	DIRN.	456	0	0	11.6	2.3	11.8

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	639	0	8	1.7	0.1	523	0	10	0	8.9	0.5
ACA	554	0	2	1.4	-0.2	538	0	3	0	7.4	1.2
AEA	185	1	4	1.9	0.9	84	0	1	0	5.0	0.0
AEL	285	0	12	1.6	-0.1	246	1	15	0	7.2	0.8
AEW	53	2	6	2.1	-0.9	50	0	4	0	10.1	1.2
AFL	266	0	2	1.7	0.4	253	1	2	0	6.5	1.2
AFR	685	1	7	1.6	0.1	600	0	8	0	8.8	-0.3
AJM	222	0	3	1.3	-0.3	198	0	3	0	6.4	0.3
AMM	47	0	2	1.7	0.6	38	0	3	0	12.2	-0.8
AMT	62	2	15	2.2	0.3	65	0	18	0	12.4	-0.1
AMX	188	2	6	1.7	0.1	144	0	5	0	9.0	0.9
ATN	27	0	100	2.4	-1.2	26	4	15	0	9.9	3.5
AZA	354	1	14	2.7	0.7	327	1	7	0	9.6	0.3
BAL	167	0	11	1.4	0.2	152	1	15	0	7.6	-0.3
BAW	441	1	17	1.8	-0.7	437	0	17	0	7.1	0.3
BPA	138	28	100	5.6	4.0	122	2	16	0	8.0	-0.8
BWA	44	0	2	1.4	-0.8	31	0	6	0	8.2	2.0
CFC	39	0	5	1.6	-0.4	38	0	8	0	10.1	1.4
CFG	434	0	6	1.7	-0.4	392	1	8	0	8.6	0.3
CKS	136	2	15	2.3	0.5	136	1	10	0	9.8	-0.5
CLX	232	0	3	1.6	-0.2	224	0	4	0	7.3	0.2
COA	61	0	26	1.4	0.2	49	2	35	0	11.2	0.3
CRL	215	0	4	1.6	0.6	192	1	7	0	11.3	-0.2
CUB	79	1	5	1.7	-0.4	69	0	4	0	6.5	1.9
DAL	903	0	7	1.6	-0.6	805	0	8	0	9.0	0.7
DCE	66	0	12	1.5	-1.2	59	0	15	0	9.6	0.5
DHL	109	2	100	6.4	-6.4	107	0	71	0	19.7	4.8
DLH	614	0	12	1.6	0.0	608	0	13	0	7.4	0.7
EDW	98	1	3	1.5	0.3	86	0	5	0	8.1	0.1
EEZ	31	0	6	1.5	0.5	27	0	11	0	12.5	-3.3
EIA	199	9	34	3.4	1.5	199	1	100	0	20.1	4.8
ELY	186	1	2	1.5	0.5	175	1	2	0	5.8	0.4
ETH	32	0	9	1.2	0.2	25	0	12	0	4.4	0.0
FDX	550	1	29	1.6	0.2	550	1	30	0	9.4	0.9
FIN	212	0	5	1.3	0.1	190	0	7	0	8.6	0.8
GAF	38	3	21	3.0	-1.7	38	3	18	0	7.1	0.6
GCO	221	1	8	1.7	0.4	219	1	14	0	10.9	2.2
GRL	42	0	5	2.1	0.2	37	0	0	0	3.8	1.5
GTI	94	0	12	1.4	-0.1	93	1	13	0	8.6	0.9
HLN	112	0	16	1.4	0.2	104	0	17	0	10.4	-0.5
IBE	938	1	7	1.6	0.1	601	1	11	0	9.0	0.4
ICE	635	0	2	1.5	-0.2	603	0	3	0	6.3	0.8
JAL	36	0	11	1.9	0.5	33	0	15	0	12.9	2.6
KLM	787	0	4	1.9	0.0	737	0	4	0	8.4	0.1
LDA	36	0	42	4.3	2.2	32	0	9	0	7.0	1.5
LDI	221	1	44	1.4	-0.3	178	1	5	0	9.2	0.5
LOT	71	0	3	1.9	-1.3	63	0	3	0	5.1	0.1
LTU	601	1	7	1.6	-0.2	494	0	6	0	7.8	0.4
MAS	21	5	19	3.9	0.1	22	0	0	0	6.4	2.2
MON	36	0	28	2.0	0.2	30	0	7	0	12.4	-1.0
MPD	39	0	0	1.4	0.4	21	0	0	0	5.8	1.2
MPH	376	0	2	1.8	-0.8	347	0	3	0	8.4	-0.3
MYT	125	1	9	1.9	-0.5	110	1	11	0	11.2	-0.3
NAO	33	0	3	1.6	-0.6	37	0	5	0	13.9	-0.5
NCA	28	0	4	1.6	0.1	26	0	8	0	7.2	1.2
NWA	1933	0	2	1.6	0.3	1926	0	3	0	7.4	0.5
OAE	125	0	6	1.4	-0.5	121	0	38	0	19.0	5.8
PAC	223	0	6	2.0	0.4	212	0	4	0	9.3	0.6
RAM	102	1	4	1.9	0.6	73	1	4	0	6.1	0.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RCH	213	1	57	3.6	-0.7	176	0	56	0	13.4	1.5
RJA	27	0	4	1.5	-0.3	27	0	7	0	14.8	1.6
RRR	92	0	5	1.4	-0.2	90	0	8	0	7.3	1.1
RZO	89	1	4	1.6	-0.2	67	0	7	0	9.7	0.0
SEU	119	2	12	2.2	-0.1	114	0	7	0	7.7	-0.5
SHE	27	0	0	1.8	1.3	26	0	27	0	14.6	-0.1
SLR	189	2	12	1.5	-0.2	185	0	11	0	7.2	0.5
TAP	188	0	4	1.6	0.1	115	0	3	0	6.5	0.4
TSC	28	4	4	1.3	-0.9	29	0	0	0	5.2	0.6
UAE	31	0	19	2.1	0.3	30	0	20	0	7.5	1.5
UAL	289	0	62	2.0	-0.9	292	0	65	0	10.1	0.7
UPS	840	0	40	1.5	-0.1	818	0	41	0	7.4	0.6
USA	166	2	2	1.4	-0.1	121	0	5	0	8.7	0.5
VIR	143	1	5	1.5	-0.1	137	1	4	0	8.7	1.8
WOA	314	2	9	1.5	0.0	309	1	9	0	8.8	1.6

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	34249	0	18	1.3	0.2	34249	0	17	0	4.9	0.6
N	410	1	7	2.1	0.5	402	0	6	0	7.7	0.7
US ACARS	17173	0	31	1.4	0.2	17173	0	27	0	5.7	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS                   NUM    NUM
IDENT TIME  ELM   LEV       OBS   GROSS      SD      RMS     BIAS


DASAP3  12    Z    100        3      0      16.4     19.2   -10.0
DBBH    00    Z    100       10      0      16.5     27.8    22.3
DBBH    12    Z    100       15      0      21.5     32.2    24.0
DBLK    00    Z    100        1      0       0.0     28.0    28.0
DBLK    12    Z    100        3      0      12.7     19.9    15.3

EASAP   12    Z    100        1      0       0.0     10.0   -10.0
EBUQ    12    Z    100       18      0      10.3     10.6     2.4
ELML7   00    Z    100        4      1      14.9     15.8     5.3
ELML7   12    Z    100        5      0      14.9     22.3    16.6
FQFL    00    Z    100        6      0      23.7     35.6   -26.5

FQFL    12    Z    100        7      1      18.2     27.0   -20.0
FQFM    00    Z    100        9      0      24.2     30.5    18.6
FQFM    12    Z    100        8      0      32.0     34.0    11.5
KHRH    00    Z    100        3      0       4.0     28.9    28.7
KHRH    12    Z    100        6      0      14.3     20.8    15.2

LDWR    00    Z    100       25      0      18.5     32.6   -26.9
LDWR    12    Z    100       27      0      20.8     34.8   -28.0
OXVH2   00    Z    100        5      0      15.1     20.6   -14.0
OXVH2   12    Z    100        5      0      14.7     17.8   -10.0
OXYH2   00    Z    100        6      0      11.0     23.1   -20.3

OXYH2   12    Z    100        5      1      32.7     39.4   -22.0
V2XM    00    Z    100        3      0       9.0     22.5   -20.7
V2XM    12    Z    100        4      0      18.6     18.6    -0.3
WPKD    00    Z    100       10      0       9.0     13.8    10.4
WPKD    12    Z    100       14      0      11.2     15.3    10.4

ZCBP6   00    Z    100       10      0      24.4     35.0    25.0
ZCBP6   12    Z    100       10      0      19.8     25.9    16.8
03953   00    Z    100       27      0      16.6     16.9     3.0
03953   12    Z    100       30      0      15.6     16.7     5.9
04018   00    Z    100       25      0      12.3     23.0   -19.5

04018   12    Z    100       28      0      15.9     21.2   -14.0
04220   00    Z    100       26      0      14.1     30.4   -26.9
04220   12    Z    100       30      0      18.0     35.3   -30.4
04270   00    Z    100       22      0      13.5     29.6   -26.4
04270   12    Z    100       29      0      13.9     25.7   -21.6

04339   00    Z    100       27      0      10.2     27.8   -25.9
04339   12    Z    100       30      0      16.1     28.3   -23.2
04360   00    Z    100       26      0      15.3     18.5   -10.5
04360   12    Z    100       29      1      15.4     19.5   -11.9
08001   00    Z    100       20      0      43.8     43.9    -3.0

08001   12    Z    100       21      0      25.6     25.9    -3.3
08508   00    Z    100       27      0       9.9     24.3    22.2
08508   12    Z    100       28      0      17.8     46.7    43.2
08522   00    Z    100       25      0       7.8     24.1    22.8
08522   12    Z    100       30      0       9.9     30.3    28.6

08594   12    Z    100       19      0      19.1     33.6    27.6
71600   00    Z    100       27      0      10.6     11.5     4.6
71600   12    Z    100       29      0      17.3     20.5    11.0
72201   00    Z    100       27      0      27.4     30.1    12.4
72201   12    Z    100       30      0      25.7     32.4    19.7

72402   00    Z    100       27      0      13.8     32.1    29.0
72402   12    Z    100       26      0      10.7     32.4    30.5
74494   00    Z    100       23      0      11.1     11.8     3.9
74494   12    Z    100       25      0      13.1     13.6    -3.5
78016   00    Z    100       26      0      11.2     25.5    22.9

78016   12    Z    100       30      0      13.9     35.7    32.9
```

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	500	3	0	8.3	13.0	-10.0
DBBH	00	Z	500	11	0	31.5	33.1	-10.3
DBBH	12	Z	500	16	0	7.1	7.7	3.1
DBLK	00	Z	500	1	0	0.0	4.0	4.0
DBLK	12	Z	500	4	0	4.7	8.6	-7.3
EASAP	12	Z	500	1	0	0.0	13.0	13.0
EBUQ	12	Z	500	21	0	6.7	9.6	-6.9
ELML7	00	Z	500	5	0	9.1	17.4	-14.8
ELML7	12	Z	500	5	0	3.8	9.2	-8.4
FQFL	00	Z	500	7	0	5.9	22.4	-21.6
FQFL	12	Z	500	11	0	35.4	42.5	-23.5
FQFM	00	Z	500	9	0	11.8	12.3	-3.4
FQFM	12	Z	500	8	0	14.2	16.2	-7.9
KHRH	00	Z	500	3	0	5.8	6.9	-3.7
KHRH	12	Z	500	7	0	3.3	5.0	-3.7
LDWR	00	Z	500	26	0	9.2	10.8	-5.7
LDWR	12	Z	500	28	0	12.3	15.9	-10.1
OXVH2	00	Z	500	7	0	7.3	11.7	9.1
OXVH2	12	Z	500	5	0	11.2	14.8	9.6
OXYH2	00	Z	500	6	0	11.7	11.9	2.5
OXYH2	12	Z	500	6	1	36.3	36.4	-3.5
V2XM	00	Z	500	4	0	9.1	10.6	-5.5
V2XM	12	Z	500	8	0	15.8	16.3	4.0
WPKD	00	Z	500	12	0	3.3	7.2	-6.4
WPKD	12	Z	500	14	0	6.6	8.3	-4.9
ZCBP6	00	Z	500	11	0	26.1	36.6	25.6
ZCBP6	12	Z	500	11	0	13.3	27.3	23.8
03953	00	Z	500	27	0	8.5	8.5	1.0
03953	12	Z	500	30	0	8.4	9.5	4.5
04018	00	Z	500	26	0	13.2	14.0	4.5
04018	12	Z	500	29	0	11.1	11.1	0.3
04220	00	Z	500	26	0	8.8	9.5	3.6
04220	12	Z	500	30	0	8.4	8.7	2.3
04270	00	Z	500	26	0	9.6	10.3	3.7
04270	12	Z	500	30	0	11.2	12.1	4.5
04339	00	Z	500	27	0	9.5	9.5	0.6
04339	12	Z	500	30	0	9.9	9.9	0.9
04360	00	Z	500	26	0	11.5	11.6	0.8
04360	12	Z	500	29	1	10.2	10.2	0.6
08001	00	Z	500	24	1	17.5	17.8	-3.6
08001	12	Z	500	29	0	18.3	18.3	-1.1
08508	00	Z	500	27	0	6.1	10.1	-8.0
08508	12	Z	500	29	0	9.1	9.1	-1.0
08522	00	Z	500	25	0	6.6	7.9	-4.3
08522	12	Z	500	30	0	7.3	7.4	1.4
08594	12	Z	500	21	0	4.6	4.7	0.8
71600	00	Z	500	27	0	6.1	10.2	-8.1
71600	12	Z	500	29	0	8.6	10.0	-5.1
72201	00	Z	500	27	0	5.8	7.9	-5.4
72201	12	Z	500	30	0	6.0	7.4	-4.2
72402	00	Z	500	27	0	7.5	7.5	-0.3
72402	12	Z	500	27	0	6.4	6.4	-0.7
74494	00	Z	500	25	0	5.6	6.9	-4.0
74494	12	Z	500	30	0	10.6	14.0	-9.1
78016	00	Z	500	26	0	5.8	6.4	2.6
78016	12	Z	500	30	0	6.2	6.9	3.0

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	100	3	0	0	4.2	1.9	-2.1
DBBH	00	V	100	9	0	0	4.1	-1.2	-0.9
DBBH	12	V	100	15	0	0	4.9	0.9	-0.7
DBLK	00	V	100	1	0	0	6.7	0.7	6.7
DBLK	12	V	100	3	0	0	5.0	1.2	2.4
EASAP	12	V	100	1	0	0	1.9	1.3	-1.4
EBUQ	12	V	100	17	0	0	6.5	2.4	-0.6
ELML7	00	V	100	3	0	0	6.7	-4.1	0.8
ELML7	12	V	100	4	0	0	4.5	1.0	2.8
FQFL	00	V	100	7	0	0	5.0	1.3	2.3
FQFL	12	V	100	7	0	0	4.0	1.3	-0.1
FQFM	00	V	100	9	0	0	4.9	0.8	-1.4
FQFM	12	V	100	8	0	0	4.0	-0.5	0.8
KHRH	00	V	100	3	0	0	9.2	8.4	0.3
KHRH	12	V	100	6	0	0	8.1	3.3	5.0
LDWR	00	V	100	25	0	0	3.1	0.4	-0.6
LDWR	12	V	100	27	0	0	3.1	1.0	0.7
OXVH2	00	V	100	2	0	0	2.4	0.2	-1.5
OXVH2	12	V	100	5	0	0	2.9	1.1	0.9
OXYH2	00	V	100	3	0	33	15.3	-5.5	5.1
OXYH2	12	V	100	4	0	0	6.6	1.5	3.8
V2XM	00	V	100	1	0	0	4.7	-2.6	-3.9
V2XM	12	V	100	4	0	0	2.7	-1.0	0.1
WPKD	00	V	100	10	0	0	4.1	0.3	0.0
WPKD	12	V	100	12	0	0	5.0	-0.9	-0.6
ZCBP6	00	V	100	9	0	0	3.7	1.3	0.0
ZCBP6	12	V	100	10	0	0	3.4	0.8	1.2
03953	00	V	100	27	0	0	3.8	-0.7	0.3
03953	12	V	100	29	0	0	3.9	0.4	0.3
04018	00	V	100	23	0	0	3.1	1.4	0.4
04018	12	V	100	24	0	0	3.2	0.9	0.5
04220	00	V	100	26	0	0	2.5	-0.2	0.1
04220	12	V	100	30	0	0	3.3	-0.1	0.4
04270	00	V	100	22	0	0	5.6	-0.8	-0.9
04270	12	V	100	28	0	0	4.1	0.0	1.3
04339	00	V	100	23	0	4	5.7	1.7	0.3
04339	12	V	100	28	0	3	5.2	0.8	-0.7
04360	00	V	100	25	0	4	5.2	0.4	0.4
04360	12	V	100	30	0	0	3.8	-0.9	0.0
08001	00	V	100	18	0	0	5.3	0.9	1.3
08001	12	V	100	19	0	0	4.0	0.3	0.4
08508	00	V	100	12	0	0	4.0	0.2	1.0
08508	12	V	100	14	0	0	5.2	1.3	-2.0
08522	00	V	100	23	0	0	4.4	0.4	-0.2
08522	12	V	100	30	0	0	3.9	-0.3	0.3
08594	12	V	100	19	0	100	5.3	1.4	2.5
71600	00	V	100	27	0	3	8.4	-2.2	-0.5
71600	12	V	100	29	0	0	5.0	-1.0	1.0
72201	00	V	100	27	0	0	3.2	0.7	0.0
72201	12	V	100	30	0	0	3.6	1.0	0.4
72402	00	V	100	27	0	0	4.4	-0.1	0.2
72402	12	V	100	28	0	3	5.9	-0.8	0.9
74494	00	V	100	23	0	0	3.2	-1.1	-0.5
74494	12	V	100	23	0	0	4.1	-0.8	0.9
78016	00	V	100	25	0	0	5.0	0.4	0.6
78016	12	V	100	30	0	0	4.9	-0.8	-0.6

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Nov 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	500	3	0	0	5.8	0.9	-2.5
DBBH	00	V	500	9	0	0	3.7	-1.0	-0.1
DBBH	12	V	500	16	0	0	4.5	0.0	0.7
DBLK	00	V	500	1	0	0	6.5	5.0	4.2
DBLK	12	V	500	4	0	0	4.2	1.1	0.5
EASAP	12	V	500	1	0	0	4.9	4.9	0.5
EBUQ	12	V	500	21	0	0	4.7	0.4	-0.9
ELML7	00	V	500	4	0	0	2.5	-0.6	0.5
ELML7	12	V	500	5	0	0	4.4	-2.1	1.3
FQFL	00	V	500	8	0	0	3.4	0.4	0.2
FQFL	12	V	500	10	0	0	2.8	0.7	0.3
FQFM	00	V	500	9	0	0	4.3	0.1	-0.7
FQFM	12	V	500	8	0	0	4.8	-1.8	0.1
KHRH	00	V	500	3	0	0	9.7	8.6	1.5
KHRH	12	V	500	6	0	0	7.2	3.8	3.7
LDWR	00	V	500	26	0	0	3.9	0.0	-0.4
LDWR	12	V	500	28	0	0	4.6	-1.2	-1.1
OXVH2	00	V	500	6	0	0	4.8	0.0	-2.5
OXVH2	12	V	500	5	0	0	4.8	0.6	0.6
OXYH2	00	V	500	4	0	0	7.7	-1.9	-3.2
OXYH2	12	V	500	6	0	16	12.0	0.9	4.1
V2XM	00	V	500	4	0	0	4.1	-0.4	-1.2
V2XM	12	V	500	7	0	0	4.3	-0.4	-1.2
WPKD	00	V	500	12	0	0	3.0	-0.5	0.2
WPKD	12	V	500	14	0	0	2.7	0.3	0.5
ZCBP6	00	V	500	10	0	0	5.1	1.0	-1.7
ZCBP6	12	V	500	9	0	0	5.6	1.0	-1.0
03953	00	V	500	27	0	0	5.2	-0.6	-0.8
03953	12	V	500	28	0	0	5.1	1.2	0.8
04018	00	V	500	24	0	0	5.1	-0.6	-1.0
04018	12	V	500	26	0	0	5.0	0.6	-0.9
04220	00	V	500	26	0	0	3.4	-0.7	-0.7
04220	12	V	500	30	0	0	4.7	0.2	0.4
04270	00	V	500	26	0	0	5.3	1.0	0.2
04270	12	V	500	30	0	0	5.6	-0.1	-0.6
04339	00	V	500	21	0	0	6.9	-1.5	0.9
04339	12	V	500	29	0	3	5.6	-0.1	-0.6
04360	00	V	500	26	0	0	5.1	-0.8	0.2
04360	12	V	500	29	0	0	5.2	-0.7	-0.7
08001	00	V	500	24	0	0	6.4	1.1	1.0
08001	12	V	500	28	0	0	4.3	1.3	0.2
08508	00	V	500	12	0	0	4.8	-2.0	-1.0
08508	12	V	500	14	0	0	3.7	-0.4	0.6
08522	00	V	500	24	0	0	4.6	0.8	0.7
08522	12	V	500	29	0	0	5.2	0.5	-0.1
08594	12	V	500	22	0	100	4.7	-0.7	-0.1
71600	00	V	500	27	0	3	9.3	-1.5	-0.9
71600	12	V	500	29	0	0	5.2	1.7	-1.0
72201	00	V	500	27	0	0	2.5	0.3	-0.8
72201	12	V	500	30	0	0	3.1	-0.4	0.2
72402	00	V	500	27	0	0	3.6	0.0	0.6
72402	12	V	500	29	0	0	3.3	1.1	-0.5
74494	00	V	500	25	0	0	3.8	-1.6	0.5
74494	12	V	500	29	0	3	4.5	-0.9	0.3
78016	00	V	500	26	0	0	4.0	0.9	-0.7
78016	12	V	500	30	0	0	3.6	0.0	-0.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45